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Report of Inquiry into Motor Vehicle Accident Compensation in Ontario

The Honourable Mr. Justice
Coulter A. Osborne
Supreme Court of Ontario
Commissioner

Volume II
Research Studies
and
Volume I Appendices



1988

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VOLUME II

INQUIRY RESEARCH STUDIES

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THE EFFECTS ON ROAD SAFETY
OF THE COMPULSORY
INSURANCE, FLAT PREMIUM
RATING AND NO-FAULT FEATURES
OF THE 1978 QUEBEC
AUTOMOBILE ACT

Prepared for the Inquiry Into Motor Vehicle
Accident Compensation in Ontario

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University of Montreal

September 1987

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1. INTRODUCTION

In this paper, we review the evidence concerning the various effects on road safety of the new automobile insurance régime introduced in the Province of Quebec on March 1, 1978, and discuss their significance with particular reference to the modified driver care levels associated with the compulsory insurance, flat premium rating and no-fault features of the new law. We present a visual analysis of the main data and summarize the results of a statistical analysis of these data made with the DRAG model of the Demand for Road use, Accidents and their Gravity. To establish the significance of the statistical results, we provide corroborating evidence on the modified risk composition of the stock of drivers.

2. EVIDENCE

The new Quebec law came into force on March 1, 1978. Primary evidence of its effects on road safety consists of claims against insurance companies and of police reports on accidents of various categories and on the number of victims. Claims against insurance companies are recorded on the basis of the policy year, which starts on July 1 and ends on June 30 of the following year; police reports are available on a monthly basis.

Claims Against Automobile Insurance Companies

One can see in Table 1 (page 5) that between 1977 and 1978, claim frequency per insured pleasure vehicle increased 20.1%, a number that almost certainly underestimates the true value because the policy year 1977 includes 4 months of data under the new régime. Under the specific heading of third party liability that had been made compulsory by the new law, claims per insured vehicle increased 41.3% in Quebec during the same period, as compared to a 2.9% increase in frequency in the rest of Canada. Although some of the increase might have been caused by the fact that the 15% of vehicles not previously insured might have differed somewhat from the rest of the vehicles and included an unusual proportion of high-risk drivers, the huge increase in the average claim frequency constitutes prima facie evidence of an important increase in accidents.

TABLE 1

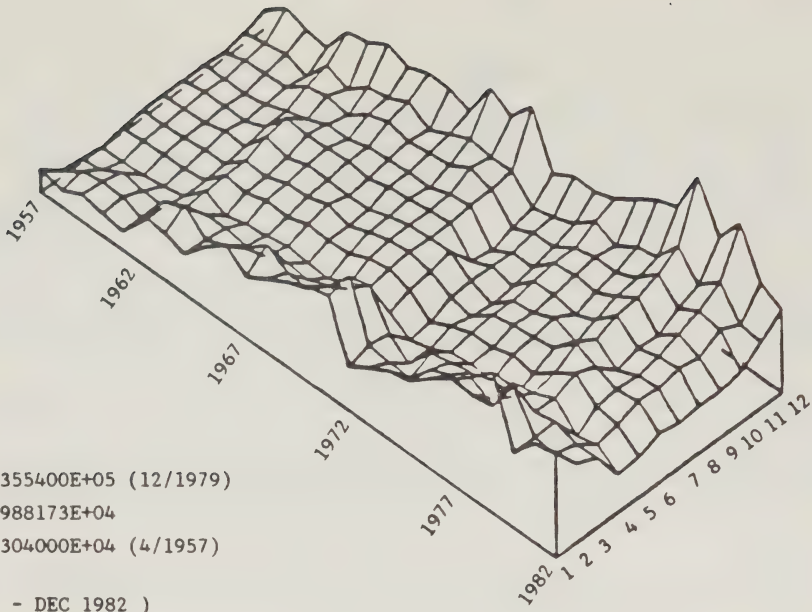
Claims Against Automobile Insurance Companies, Quebec 1973-1984
(Claims per 100 insured private automobiles (farmers included))

Policy Year	73	74	75	76	77	78	79	80	81	82	83	8
A. Overall Claim Frequency:	28.7	29.2	28.4	25.5	23.4	28.1	31.8	33.2	33.0	26.7	26.5	28
B. Third Party Liability:												
Quebec	10.6	10.6	9.8	8.6	7.5	10.6	12.1	12.0	11.8	9.3	9.1	9
Rest of Canada	n.a	8.5	7.8	7.1	6.9	7.1	6.9	6.7	6.7	6.0	5.4	5
Difference	—	2.1	2.0	1.5	0.6	3.5	5.2	5.3	5.1	3.3	3.7	4

Source: Table 3.1, Table 3.2 and Table 3.B in [1].

Accidents and Road Victims

An even stronger increase occurs in the official monthly data on accidents and road victims when the values for the twelve months before March 1, 1978, are compared to the values during the first twelve months of the new regime: the total number of accidents increased by 26.9%¹ and the number of victims by 29.7%. Moreover, all the components of these two totals increased significantly. As shown on Graph MA, (page 6) accidents with material damages only reported to the police and involving estimated damages greater than a certain criterion value increased by 26.3% despite the fact that the criterion was increased from \$200 and \$250 in 1978; accidents with at least one injury (no deaths) increased by 31.8% and fatal accidents increased by 7.0%. In these accidents with bodily damages, the number of injuries shown on Graph HT (page 7) increased by 30.6% and the number of fatalities shown on Graph DE (page 8) increased by 6.4%.



MA

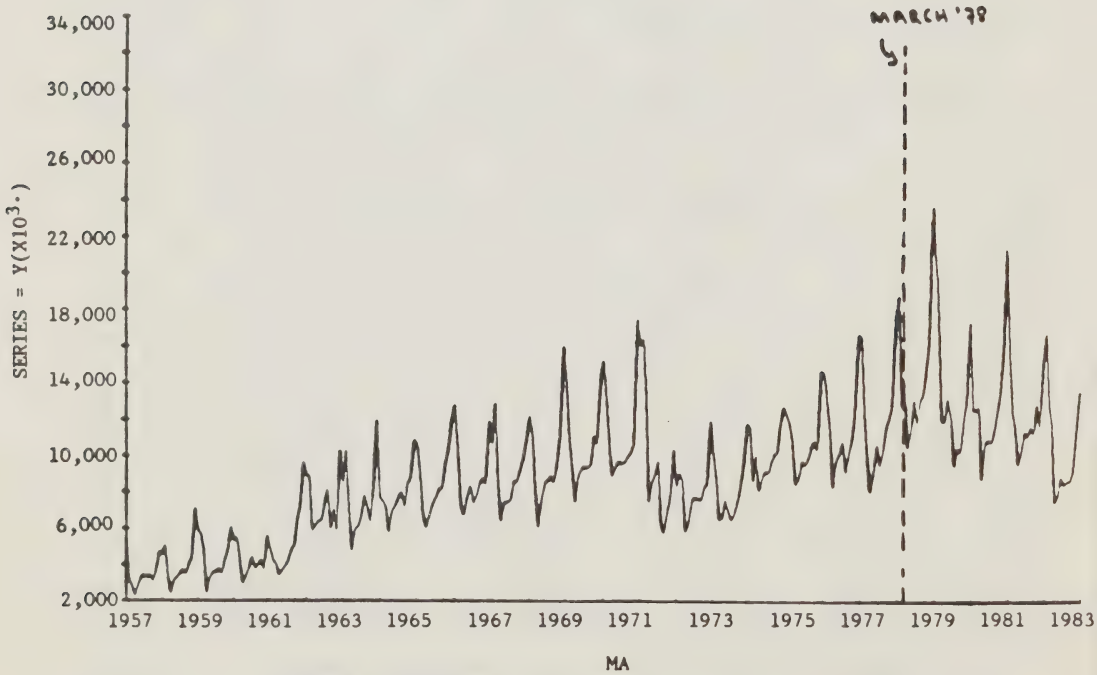
MAX = .2355400E+05 (12/1979)

M(Y) = .8988173E+04

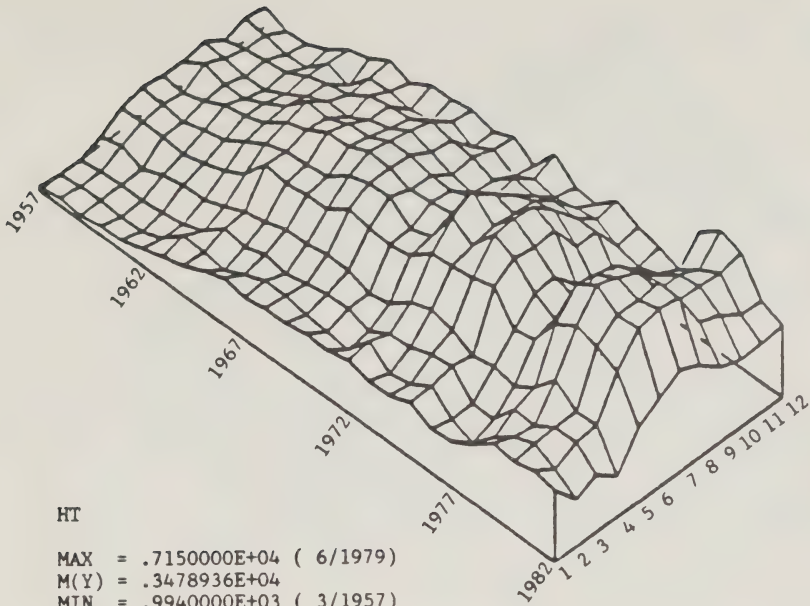
MIN = .2304000E+04 (4/1957)

(JAN 1957 - DEC 1982)

NUMBER OF ACCIDENTS WITH MATERIAL DAMAGES ONLY. QUEBEC



NUMBER OF ACCIDENTS WITH MATERIAL DAMAGES ONLY, QUEBEC
(JAN 1957 - DEC 1982)



HT

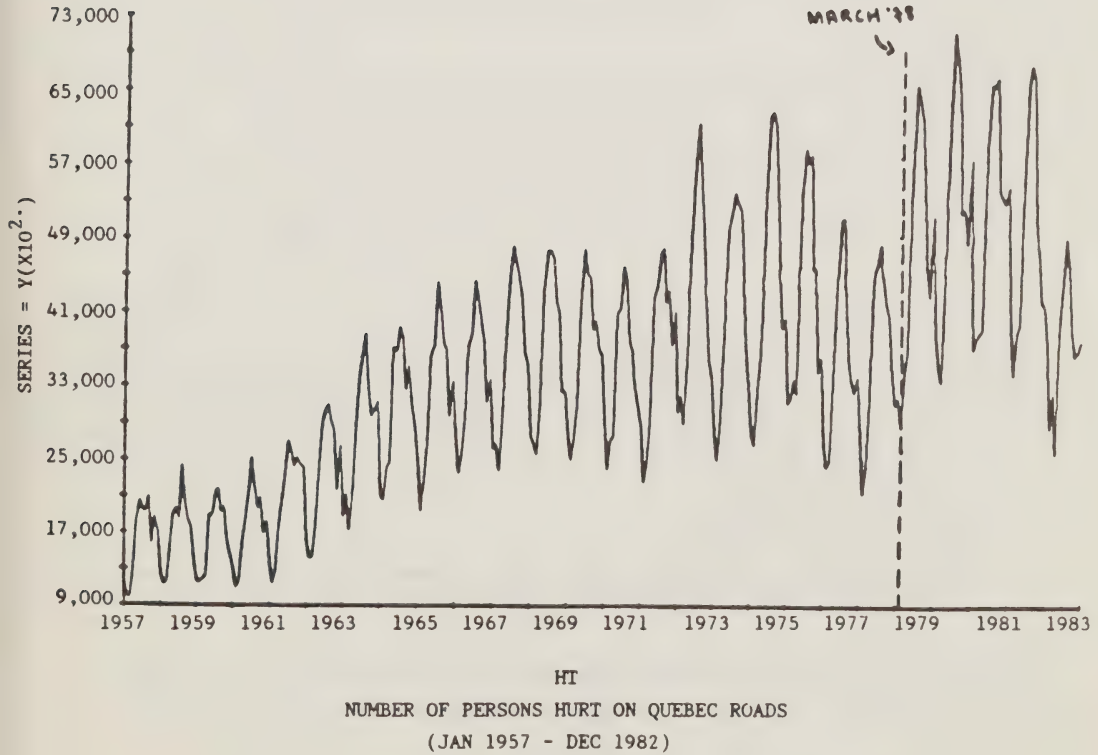
MAX = .7150000E+04 (6/1979)

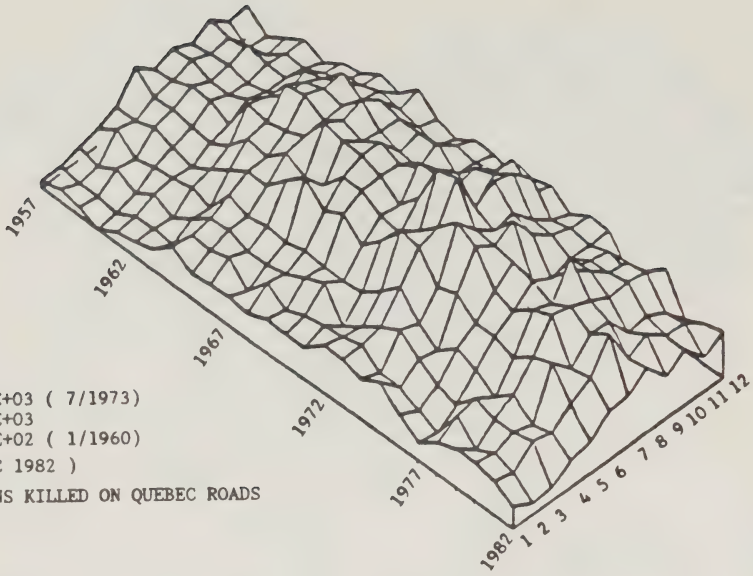
M(Y) = .3478936E+04

MIN = .9940000E+03 (3/1957)

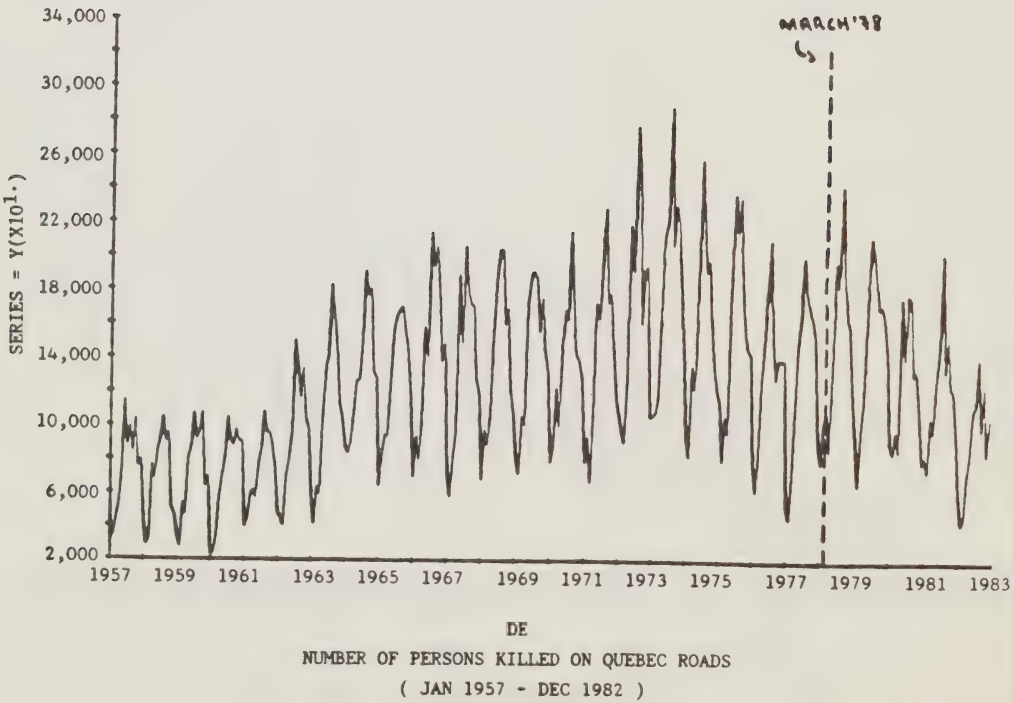
(JAN 1957 - DEC 1982)

NUMBER OF PERSONS HURT ON QUEBEC ROADS





DE
 MAX = .2880000E+03 (7/1973)
 M(Y) = .1238179E+03
 MIN = .2100000E+02 (1/1960)
 (JAN 1957 - DEC 1982)
 NUMBER OF PERSONS KILLED ON QUEBEC ROADS



We now describe shortly the features of the 1978 Act; we then summarize and interpret the results of a statistical study that estimates its effects.

3. THE 1978 QUEBEC AUTOMOBILE ACT

Main Characteristics For Our Purposes

The Act split the previous accident insurance system as follows:

Bodily Damages: It removed the notion of fault for corporal damages (injuries or fatalities) and established a basic compulsory public plan financed jointly from general revenues² and from a uniform premium system (for given classes of vehicles) independent from an individual's risk class and safety record. It introduced a centralized compensation system that generally increased greatly with speed, frequency and size of compensation[1]. This:

- A. reduced the average premium³ for corporal damages, and the total premium [2], a price change that would reduce driver care;
- B. increased the total number of drivers through both the lower average premium and the important further relative price reduction for individuals belonging to the worst risk classes (as their demand for driving licences was probably more elastic than the demand of those whose faced a relative price rise);
- C. lowered the average quality and motivation to safety of the stock of drivers because of the sudden subsidy given to relatively risky drivers and the suppression of the notion of fault for all drivers; and
- D. encouraged individuals to classify as accidents with injuries accidents previously declared as accidents with material damages only, because of the more favourable compensation system.

Material Damages: It maintained the notion of fault for material damages, but made civil liability insurance for

them compulsory. It introduced mechanisms for the direct and fast payment of indemnities by the private insurers. This:

- E. raised the price of keeping a car for the 14-18% pleasure vehicle owners not previously insured, thus reducing the number of cars;
- F. reduced the motivation to prudence of these newly insured owners; and
- G. increased slightly the incentive to report to the police and to insurers minor accidents (with material damages only), because of faster compensation.

Representation of These Changes For Modeling Purposes

In the DRAG model that we built [3,4] to explain the number of accidents and the number of victims, there are two ways of measuring the impact of these changes.

Changes such as (A) on the average level of automobile insurance prices, (B) on the total number of licensed drivers and (E) on the level of car ownership occur through three variables describing respectively the cost of maintaining a car, the number of licensed drivers per car and the number of cars per person. DRAG results suggest that the effects on road safety caused by CHANGED LEVELS OF THESE THREE QUANTITATIVE FACTORS are not negligible but are difficult to be precise about. Moreover, the variations brought about by the new Act may have been qualitatively different from previous variations.

Some modifications in the qualitative significance of price, in the tenure of driving licences, or in the quality of the stock cars, are captured by a qualitative "dummy" variable that also simultaneously measures the effect of other clearly QUALITATIVE changes (C) and (F) in the quality of drivers and driving. DRAG results show that the net effect of the qualitative changes are very important and that the new Act clearly increased all categories of accidents and victims, but the exact value of the increase cannot always be ascertained exactly because some of the estimates may sometimes be tainted by the presence of declaration effects (D) and (G).

Let us now present the basic idea of the model in order to understand our estimates of the effects of both quantitative and qualitative factors.

4. MEASURING STRUCTURAL CHANGE WITH THE DRAG MODEL

Basic Idea and Specification: Direct and Indirect Effects

The basic idea of the DRAG model is to explain the number of road accident victims, VI, by studying together the mechanism that determines the demand for road use, DR, and the mechanism that determines the road safety performance record. In the first mechanism, road use (exposure) is measured by motor vehicle fuel sales and explained by a set of factors, X^{dr} . The second mechanism is itself decomposed into an explanation of the number of accidents, AC, and an explanation of their severity, GR; both are explained by road use, DR, and the factors, X^{vi} . The product of the number of accidents and their severity yields the number of victims. This can be written symbolically as:

Motor Vehicle Fuel Sales	DR <--- (, X^{dr}) °Demand
Accidents	AC <--- (DR , X^{vi})
Severity (victims per accident)	GR <--- (DR , X^{vi}) °Performance
Victims	VI <--- AC x GR

The advantage of adding a demand level to a performance level sometimes studied alone by other authors is that one can obtain estimates of the "total" impact of various factors that explain both road use and performance (i.e., that appear in both X^{dr} and X^{vi}) by tracing their influence on the number of accidents or victims through changes in road use in addition to their effects on performance for a given level of road use. For instance, snow certainly has a direct impact on accidents or their severity at any level of road use but it also has an indirect effect through its influence on the amount of driving. The same will be the case below for the new automobile insurance régime.

The advantage of analyzing the number of victims through a distinction between the explanation of accidents and the explanation of their severity, instead of immediately explaining the number of victims, is real: one gains information by finding out whether the explanatory factors considered have the same influence on the frequency of accidents and on their severity.

We are here concerned with the application of this model structure to Quebec: all variables are defined for the Province of Quebec as a whole for the 313 consecutive months from December 1956 until December 1982. Much of the new econometric methodology applied in DRAG is also described and tested in other technical reports [5,6].

Explanatory factors used in the various equations belong to seven major categories: the level and composition of the DEMAND FOR ROAD USE and of PRICES, the availability and characteristics of MOTOR VEHICLES, the state of TRANSPORTATION NETWORKS (described by traffic laws and police patrol, the service levels of the travel modes, and road infrastructure properties including the weather), CONSUMER CHARACTERISTICS of a general and of a specific nature (linked to age, sex and vigilance), the level and composition of final and intermediate ECONOMIC ACTIVITIES and trip purposes, and accounting or ADMINISTRATIVE measurement practices. The very long time series used make it possible to test the influence of a large number of explanatory variables but here we will only single out model features related to the quantitative and qualitative changes associated with the 1978 Quebec Automobile Insurance Act.

Effects of Three Quantitative Factors

One finds in Table 2 (page 13) the elasticities of selected dependent variables of the model with respect to the three explanatory variables affected by the 1978 Act. These elasticities are defined as the ratio of the percentage change of each explained variable with respect to the percentage change of the explanatory variable considered and are evaluated at the mean value of the sample.

Increases of the real price of maintaining a car, defined as the maintenance and insurance price (excluding any fuel and depreciation components), are associated with

TABLE 2

Elasticities of Quantitative Factors Modified By 1978 Automobile Insurance Act

Dependent Variable	Price of Maintaining a Car			Number of Licensed Drivers Per Car			Number of Cars Per Person		
	Direct	Ind.	Total	Direct	Ind.	Total	Direct	Ind.	Total
	(t-st.)			(t-st.)			(t-st.)		
<u>ROAD USE</u>									
::: Gasoline Sales	0.205 (1.96)			0.073 (0.40)			0.269 (1.32)		
::: Diesel Sales	0.273 (0.68)								
<u>ACCIDENTS with</u>									
(1) Property damage only	-0.629 (-3.03)	0.193	N	-0.371 (-1.78)	0.064	-.307		0.234	
(2) At least one injury, no deaths	-0.728 (-3.97)	0.107	N	-0.089 (-0.47)	0.035	-.054		0.130	
(3) At least one death	-1.01 (-3.90)	0.133	N	-0.604 (-1.95)	0.043	-.561		0.158	
(2)+(3) Bodily damage	-0.740 (-3.77)	0.108	N	-0.060 (-0.64)	0.036	-.024		0.131	
(1)+(2)+(3) Total accidents	-0.653 (-3.91)	0.174	N	-0.303 (-2.22)	0.058	-.245		0.211	
<u>SEVERITY</u>									
...									
<u>VICTIMS</u>									
(4) Injuries	-0.797	0.118	N	-0.313	0.041	-.272		0.149	
(5) Fatalities	-1.018	0.258	N	0.257	0.091	.348		0.333	
(4)+(5) Total victims	-0.840	0.123	N	-0.293	0.042	-.251		0.155	

Direct: Holds road use constant.

Indirect: Allows for variation in road use.

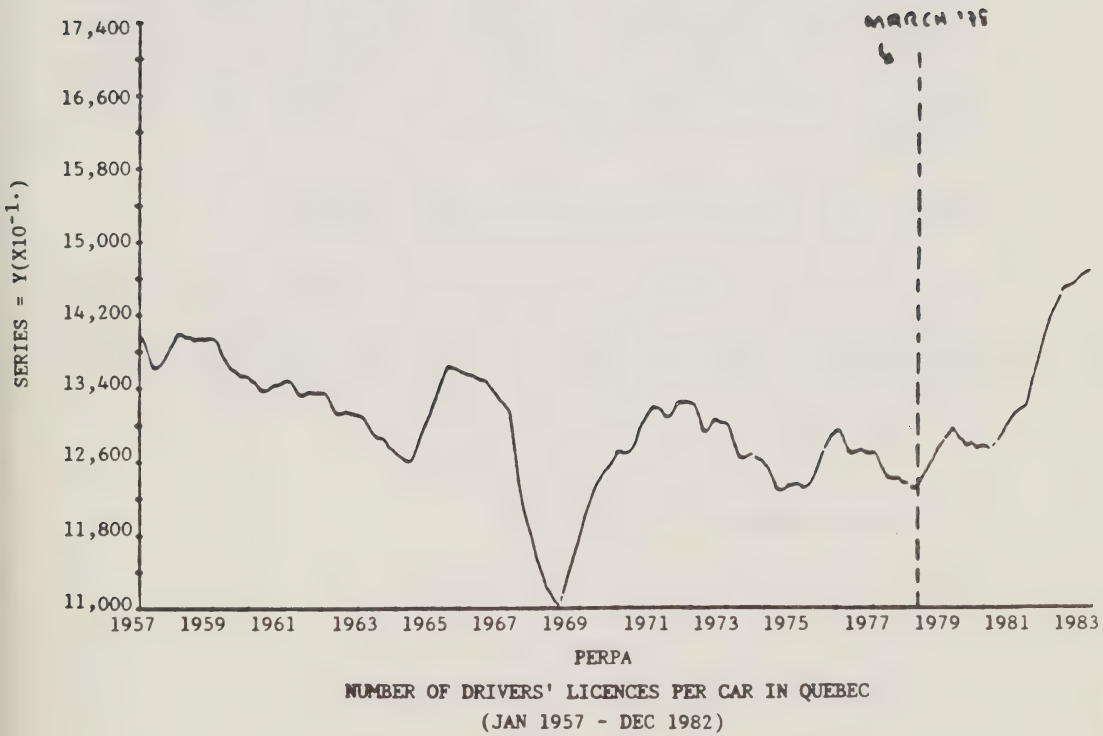
Total: Direct + indirect, unless the sum is not relevant (indicated by N).

Reference Model: Found in [3].

t-statistics of underlying regression coefficients shown in parentheses are computed conditionally upon the estimated functional form of the regression equations and differ from the unconditional values presented in [3].

increased consumption of fuels and significant reductions in the number of accidents (and of their severity, but these results are not shown). This suggests that higher maintenance prices reduce engine tune-ups, causing higher fuel consumption, and reduce general maintenance, stimulating driver care and lower speed adjustments that reduce accidents and their severity. Lefebvre and Fluet have studied the evolution of the real price of insurance in Quebec and have estimated that the price of a dollar of compensation for material and bodily damages fell from \$1.69 to \$1.37 because of the Act [2, p. 48]. **If this 22% decrease is taken as the "best educated guess" of the price change,** the Quebec part of the national index used in the model fell by 8.54% and the index itself by approximately 2.15% (the structural change being absorbed by the qualitative variable).

Increases of the number of licensed drivers per car reduce the number of categories of accidents but, because of opposite effects on the severity of accidents with injuries and fatal accidents (results not shown), injuries decrease and fatalities increase: presumably, with fewer occupants per car, drivers increase speed (gasoline consumption increases slightly, but that may also be due to increased exposure). Visual analysis of Graph PERPA (page 15) shows an immediate increase of about 6% immediately after the implementation of the Act, followed by continuing increases. **This 6% increase is then a conservative "best educated guess" of the short-run effect of the new price structure,** perhaps half of which is due to the increased supply of drivers.



Increases of the number of cars per person increase road use and, indirectly, accidents and victims. One notices on Graph AUPPOP (page 17) the dramatic turn-around of car ownership in Quebec since the implementation of the Act. The first significant drop in car ownership ever seen -- about 3% -- is followed by a relatively slow recovery and a massive fall of ownership levels. The influence of extraordinarily high real gasoline prices after 1979 (they increased by 60% between 1979 and 1982), the exodus of households with higher than average car ownership levels and the recession of 1982 may all have contributed to breaking the trend. **The 3% drop during the first year of the Act is a "best educated guess" of the impact of forcing owners to have insurance** by requesting a proof of insurance for material damages and tying the registration fee to the payment of a premium for bodily damages: registering many (presumably old) cars became too expensive.

Effects of Qualitative and Structural Changes

Table 3 (page 18) shows the percentage variation of each dependent variable due to the qualitative change brought by the Act. These variations are computed at the mean value of the sample, i.e., for an "average point" rather than at the specific moment of implementation of the legislation.⁴

5. SIGNIFICANCE OF THE RESULTS

The Principal Effects of the 1978 Act

Table 4 (page 19) summarizes the main effects of the 1978 Act, estimated both visually and with the help of a combination of DRAG model results and educated guesses. Estimates based on the model are lower than the visual estimates: if model elasticities had been evaluated for the 12 months previous to the implementation of the Act, and not for the whole sample period, they would be somewhat lower (as indicated by the starred values). This being said, it is clear that, although it is difficult to be precise about the impact of the Act on the level of the three quantitative factors considered, most of the impact of the Act occurs through its qualitative or structural change: in Table 4 (page 19), adding up the first three columns yields -1.19%, -0.37% and 3.26%, or values that

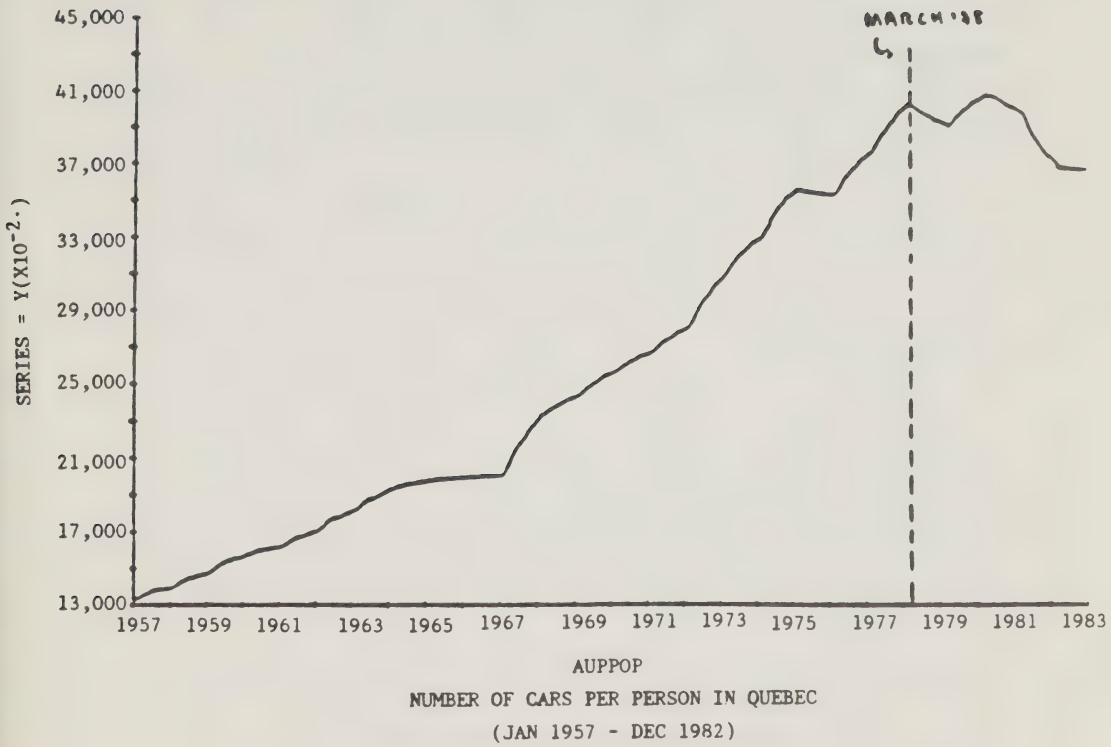


TABLE 3

Qualitative Effect of 1978 and 1961 Automobile Insurance Acts

Dependent Variable	March 1978 Act			July 1961 Act					
	Reference Model			Reference Model			Model Variant		
	Direct	Ind.	Total	Direct	Ind.	Total	Direct	Ind.	Total
	(t-st.)			(t-st.)			(t-st.)		
<u>ROAD use</u>									
::: Gasoline Sales	2.6 (0.76)			3.4 (1.35)			3.5 (1.44)		
::: Diesel Sales	5.0 (0.42)			12.4 (1.56)			11.9 (1.44)		
<u>ACCIDENTS with</u>									
(1) Property damage only	8.5 (1.08)	2.5	11.0	24.9 (6.53)	3.6	28.5	26.5 (7.45)	3.9	30.4
(2) At least one injury, no deaths	26.3 (8.13)	1.4	27.7	13.1 (3.50)	2.0	15.1	15.2 (4.24)	2.2	17.4
(3) At least one death	3.3 (0.58)	1.7	5.0	-3.7 (-0.63)	2.6	-1.1	12.6 (1.86)	2.4	15.0
(2)+(3) Bodily damage	25.3 (7.18)	1.4	26.7	12.4 (3.14)	2.0	14.4	15.1 (3.81)	2.2	17.3
(1)+(2)+(3) Total Accidents	12.1 (2.39)	2.3	14.4	22.2 (6.76)	3.3	25.5	24.0 (7.71)	3.5	27.5
<u>SEVERITY</u>									
...									
<u>VICTIMS</u>									
(4) Injuries	24.8	1.5	26.3	5.9	2.1	8.0	10.1	2.3	12.4
(5) Fatalities	3.6	3.2	6.8	-9.1	4.4	-4.7	1.7	5.2	6.9
(4)+(5) Total Victims	24.0	1.6	25.6	5.4	2.2	7.6	9.9	2.4	12.3

Direct: Holds road use constant.

Indirect: Allows for variation in road use.

Total: Direct + Indirect

Reference Model: Found in [3].

Variant Model: Unpublished results with driver quality risk index.

t-statistics of underlying regression coefficients shown in parentheses are computed conditionally upon the estimated functional form of the regression equations and differ from the unconditional values presented in [3].

TABLE 4

Main Effects of 1978 Automobile Insurance Act

Dependent Variable	% change					VISUAL
	Based on DRAG results and due to					
	Price of Maintaining a Car	Licensed Drivers Per Car	Cars Per Person	Qualitative Structural Change	Total	
<u>ACCIDENTS with</u>						
(1) Property damage only	1.34	-1.84	-0.70	11.00	9.81 7.43*	26.29
<u>VICTIMS</u>						
(4) Injuries	1.70	-1.63	-0.45	26.30	25.93 24.04*	30.58
(5) Fatalities	2.17	2.09	-1.00	6.80	10.06 9.12*	6.35

Values for the first three columns are obtained by multiplying respectively the direct, total and indirect elasticities of Table 2 by the best educated guesses described in the text. Starred values denote values obtained by evaluating the model elasticities on the same basis as that used for the visual estimates -- the twelve months previous to the implementation of the Act.

would not offset the corresponding values of 11.0%, 26.3% and 6.8% unless the "best educated guesses" used to obtain the results for the three quantitative factors were dramatically modified. It is clear that we must discuss the significance of the qualitative-structural factor.

Increased Moral Hazard and Adverse Selectioni) Reporting Effects or Moral Hazard After the Fact

In Section 3, we pointed out the possible presence of a reporting effect and distinguished between characteristic (D), a motivation to report some accidents with material damages only as accidents with injuries, and characteristic (G), a motivation to report accidents with material damages only, more willingly to insurance

companies. In the absence of further data, for instance on the number of hospital admissions related to road accidents, the possible tendency to exaggerate claims for injuries cannot be ascertained exactly; neither can we measure the net reporting effect on accidents with material damages only. However, it is certain that reported increases in such accidents and in injuries are not solely due to a possible reporting effect: this would imply that fatalities (that can be neither faked nor hidden) had increased⁵ because of higher road use and qualitative change associated with the Act, but that all other measures of road safety had remained unchanged. Moreover, other considerations to be presented shortly also imply real increases in all measures of road safety.

ii) Compulsory Insurance and Moral Hazard

The first consideration that points to a strong real component in all three main measures listed in Table 4 (page 19), is the effect of characteristic (E) of the Act, which effectively increased to about 100% the proportion of vehicles insured by insurance companies. This may seem unexpected because the obligation to carry a minimal amount of third party liability insurance existed since July 1961; it appears that the added obligation to show proof of private insurance for material damages and to pay a premium for bodily damages simultaneously with the vehicle registration application made it more difficult than before to avoid insurance. The 1961 law increased the proportion of insured vehicles approximately from 0.65 to 0.81, a variation that is comparable to that of the 1978 law. An idea of the effect of this forced insurance may be had by consulting Table 3 (page 18) where two estimates of the effects of the 1961 law are given.⁶ Both models indicate increased fuel sales, increased accidents with material damages only and increased injuries; the effect on fatalities is uncertain, but on balance probably positive. It seems that forcing consumers to be insured reduces their care; in this respect, the 1978 law simply had more administrative teeth than the 1961 law, and certainly reduced driver care, but one cannot assign a precise part of the total increase to it, even on the basis of the 1961 results, because the remaining 15% of uninsured vehicles must have been different from the previous group that had been responsive to the requirements of the previous law.

iii) No-fault and Moral Hazard

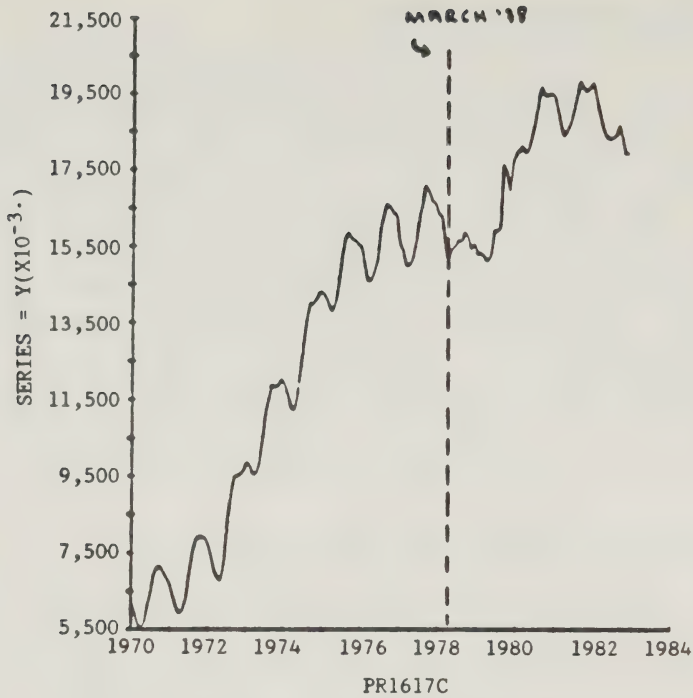
Essentially, being forced to be insured reduces the consumer's size and variability of loss in the event of an accident; the no-fault provision of the law also reduces the rewards of driver care but, in the absence of previous experience with this feature of the Act, there is no way to assess its importance, let alone compare it with the forced insurance and flat premium parts of the total effect. For other jurisdictions, we have not found modeling results on comparable complete no-fault systems for bodily damages; neither do Landes' [5] results on the introduction of limited no-fault insurance in 16 American states provide any guidance: they were obtained with a very simple model and shown by Zador and Lund [6] to be very sensitive to slight changes in specification.

iv) Flat Premium Rating and Adverse Selection

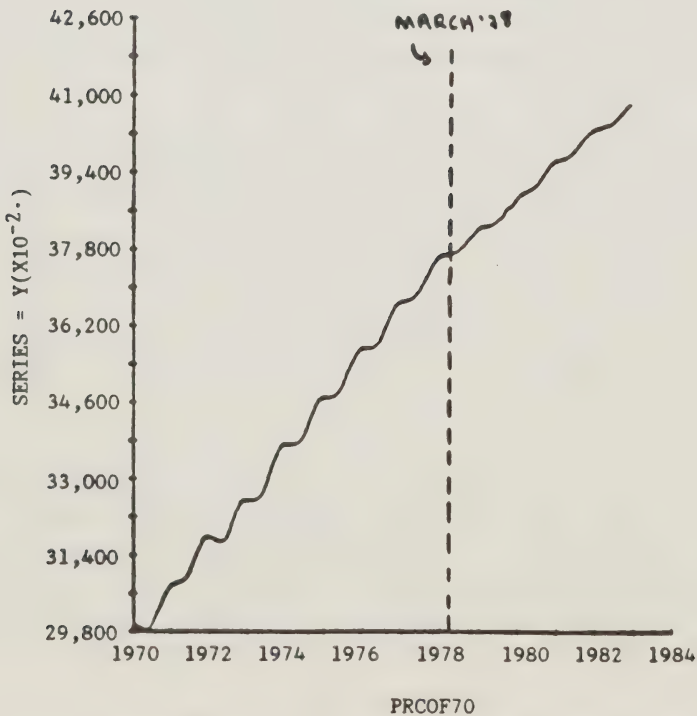
A third consideration pointing to a strong real component in the totals for (1) and (4) in Table 4 (page 19) is the indirect evidence of the impact of the uniform premium system for bodily damages. By subsidizing "bad risk", this system created adverse selection. Of course, "bad risks" have higher accident rates in all accident categories -- not only in the fatal category. Evidence of this additional adverse selection, with a significant effect on the risk composition of the stock of drivers, is extremely strong.

Consider Graph PR1617C (page 22) showing the proportion of drivers belonging to the 16-17 age group. The age pyramid was such that their share of the total stock of drivers was stabilizing around 1976 and 1977. The new Act shifted this plateau upwards by about 2-3 percentage points, a 15-20% increase of the share. In [3], we show that the relative participation rate of the 18-19 age group also increased rapidly for 2 years before getting back on trend.

Of course, the effect of the subsidization of relatively bad risks did not occur only in these obvious classes. One can see on Graph PRCOF70 (page 22) that the proportion of women in the stock of drivers, which had been increasing according to a linear trend, suddenly started increasing much more slowly along a new trend line -- the slope suddenly changed, as one would expect from a



PROP. OF DRIVERS 16-17 YEARS OLD (CORRECTED) IN QUEBEC
(JAN 1970 - DEC 1982)



PROP. OF FEMALE DRIVERS (1970-82 MO. PROC.) IN QUEBEC
(JAN 1970 - DEC 1982)

structural price change taxing women to the benefit of men.

Our "best educated guess" of a 3% increase in the number of driver permits does not mean that all of this increase consisted in "bad risk". The Act lowered the average price of insurance and changed relative prices, and perhaps also some absolute prices, to the disadvantage of "good risk", some subcategories of which might have shrunk. Adverse selection only means that the average quality of the stock of drivers fell.

6. CONCLUSION: DETERRENCE AND EFFICIENCY

With the help of the DRAG model, we conclude that the 1978 no-fault law in Quebec certainly increased real (not only reported) road accidents and victims but that the estimated increases, although plausible and conservative when compared to the results of intuitive visual analyses, are not all very significant in a statistical sense. Our results also suggest that the main effects of the law did not occur because of the subsidized and reduced average real price of insurance, the resulting increased number of drivers, or the decreased number of cars: they apparently occurred because of the qualitative and structural change of the new system. This structural change consisted mainly of (i) forcing 14-18% of uninsured vehicles to carry insurance, (ii) removing the notion of fault for bodily damages and (iii) charging a flat-rate insurance premium for bodily damages independently from the driver's safety record. It is not possible to unravel the influence of each of these three simultaneous components, but previous moral hazard experience with compulsory automobile insurance and the very strong evidence of adverse selection caused by the subsidization of highrisk drivers suggest that the contribution of no-fault, as such, to the reduction of driver care and deterrence was very small compared to the contributions of the two other elements.

It is in principle possible to correct most of the inefficiencies caused by the law by setting up an adequate rating system that induces individuals to face the true social road safety cost of driving. Boyer and Dionne [7,8] have shown that multi-period no-fault insurance contracts based in part on the individual's past driving record can give individually rational self-protection activity levels that are socially efficient over time in the presence of both moral hazard and externalities; they are studying the empirical foundations of such a system and have already shown [9] that an individual's previous accident, demerit point and infraction records are significantly related to the probability of accident. The detailed design of an experience-rated pricing system, particularly of one compatible with the absence of discrimination on the basis of age or sex, or the formulation of an equivalent combination of insurance premia and fines, is an empirical matter that will take time to evolve. It is also clear that the potential inclusion of

of information from police records into the pricing system is easy in the presence of a centralized rating agency or mechanism.

ENDNOTES

1. As the proportion of insured vehicles increased by 19% from 84% to 100%, this number is compatible with the 20% increase in the frequency of claims per vehicle experienced by insurance companies.
2. A part of the existing tax revenues from fuel sales was earmarked to finance the public régime, but the tax rates on fuel were not increased.
3. As shown in [2], it is difficult to estimate the real price change as one has to take into account the new structure of the private sector as well as the respective roles of economies of scale, subsidies from general revenue and internal accounting rules within the new public administration.
4. The DRAG report uses a new analytical formula to compute these "elasticities" for dummy variables. The formula used is exact in the case of linear equations and approximate in the case of non linear equations.
5. On a calendar year basis, fatalities increased from 1,556 to 1,765 (13.43%) in Quebec as they fell from 3,697 to 3,664 (0.89%) in the rest of Canada between 1977 and 1978. (Reported in: G. Ledoux, BILAN INTERNATIONAL des victimes de la circulation routiere de 1970 a 1981: le Québec et le Canada. Rapport technique. - Régie de l'Assurance Automobile du Québec, avril 1985).
6. Estimates obtained with the model variant are probably more accurate than those of the reference model because they are based on a more refined representation of the influence of the lowering of the minimum driving age a year later.

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OVERVIEW OF RESEARCH REPORT
INTO AUTOMOBILE INSURANCE
MARKET IN ONTARIO

Prepared for the Inquiry Into Motor
Vehicle Accident Compensation in Ontario

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September 1987

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I. INTRODUCTION AND OVERVIEW

The Ontario automobile insurance industry has been the subject of analysis and debate periodically over the last 15 years. The questions about the competitive structure of the industry and whether there should be a government-run monopoly (Crown Corporation) seem to be highly correlated with major increases in automobile insurance premiums and limited availability in coverages.

Just recently, interest in this area has re-emerged due to high premiums for certain sub-groups of drivers, teenagers and taxicabs for example, to allegedly high premiums in Ontario compared to the public systems in Manitoba, Saskatchewan and British Columbia, and to the large increases in Ontario's premiums over the last few years.

The public versus private delivery of Ontario automobile insurance has received increasing attention recently; one of the opposition parties made the introduction of a public automobile insurance system a major plank in its election campaign. Public awareness of the issue has been heightened by comparisons of premiums for particular classes of drivers across the public and Ontario systems. The Ontario government in response to these concerns has frozen premium rates, required a roll-back in rates for teenage drivers and has announced the establishment of an auto insurance rate review board; this board would provide regulatory oversight on Ontario insurance rates.

In addition, the Ontario government recently established a task force under Justice Osborne to conduct an inquiry into Motor Vehicle Accident Compensation in Ontario. The emphasis of this Inquiry is the current tort system of compensation for injury and the implications of changes to a system of no-fault. In the terms of reference, one area for study was an evaluation of a private versus public delivery of a no-fault system of automobile insurance. This issue, as formulated in the terms of reference, covers two areas: public versus private delivery efficiency holding tort system constant and fault versus no-fault, holding delivery constant. It is the first of these two areas that is covered in this report and the background studies.

This research project investigates the state of competition in the Ontario automobile insurance industry with a view to identifying any competitive problems and recommending an appropriate regulatory response. The regulatory response, apart from the existing solvency and minimum capital requirements, can range from information provision to consumers about the insurance product, through formal rate regulation, to the establishment of a Crown Corporation to provide automobile insurance. Some underlying assumptions of the study were the maintenance of the current fault system and the continued use of some system of risk rating to establish differential insurance premiums. In this report, the negative consequences of minimizing risk differences in premiums will be considered in section III.

Three studies, commissioned for this project, address the areas of competition in the industry, efficiency comparison of public versus private automobile insurance systems, and the appropriate regulatory response to observed competitive problems in the industry. The first area of interest was investigated using the widely-accepted structure-conduct-performance paradigm. This methodology determines whether industry structure and performance is consistent with a competitive or collusive market. In addition to an evaluation of the overall automobile insurance market, sub-markets such as re-insurance and taxicabs are also considered. The structure analysis was undertaken in the report by Professor Potvin; industry performance was evaluated by Professor Booth in his report. The conclusions of these studies are that the structure and performance of the industry are consistent with a competitive market; potential problems in sub-markets are unlikely to be serious; and premium levels reflect the expected costs of providing insurance.

The issue of the relative efficiency of public and private plans is investigated by Professor Booth. Given that economies of scale are non-existent and entry and exit is observed in the market, it is unlikely that public systems are any more efficient than private ones. Any observed expense differences are related to differences in services provided and procedures undertaken. Although direct estimates of the costs incurred by public plans if they engaged in the same functions as private plans are not available, indirect evidence suggests that public plans would not have significantly lower costs. In addi-

tion, a number of costs incurred by private systems need not be covered by the public systems; examples are corporate income taxes, direct charges for use of government services, and in the case of British Columbia, the 3% premium tax. These subsidies clearly bias the comparison against the private companies. The conclusion is that public systems are not more efficient than private ones and cost imputations associated with subsidies could result in their being more expensive. One important conclusion is that comparisons of premium levels are at best a rough indication of relative efficiency and at worst, are misleading. Therefore, little reliance is placed on these comparisons.

The final issue of regulatory response is considered in the paper prepared by Professor G.D. Quirin. This paper summarizes the regulatory practices of a number of jurisdictions and considers the problems associated with these practices. An important implication of this study is that there will be serious problems of employing rate review procedures when the industry is essentially competitive. The problems include a reduction in innovative rating procedures, no competition in pricing, diminished entry from the industry, substantial costs of the regulatory process, a reduced supply through increased exit, and with the removal of competition, a decrease in operating efficiency. An alternative scenario is that the regulatory process could be "completed" either by the industry or the political process. If the former, rates under regulation would be higher. If the latter, uneconomic cross-subsidies could be introduced. The conclusion is, given that the industry is competitive, no regulation over and above the existing solvency/capital requirements is necessary. If regulation is desired for non-economic reasons, the best approach is the California model which relies on market competition to regulate prices and a regulatory oversight to evaluate the degree of competition in the markets. The next best alternative is a file-and-use system where there is no constraint on the use of differential rates on the same policy or on the use of policies that deviate from the standard policy.

If there is a perceived problem with consumer ignorance concerning the product, this should be addressed directly by information provision. However, there are other products which are difficult to interpret where information provision is not required. In addition,

insureds do shop around since the lapse rate with the insured's current broker is about 15 to 30% per year. These individuals must be switching based on some information such as price for a given set of coverages.

This report is structured as follows: in section II some analytical issues are described to provide the framework for the analysis. The section describes the product, develops a model for insurance and draws some implications from this model for the setting of premiums and describes the concept of market failure along with the appropriate regulatory responses; in section III the structure-conduct-performance analysis is presented. Section IV addresses the efficiency of public compared to private delivery of insurance and deals directly with some of the conclusions of the Woods Gordon Study on this issue; the regulatory response is provided in section V and conclusions and recommendations are summarized in section VI.

II. SETTING THE FRAMEWORK FOR ANALYSIS

1. Market Failure and the Regulatory Response

Economists have long extolled the virtues of a competitive market; this, in fact, is the norm against which all other potential market structures are evaluated. In a competitive market, prices charged for goods and services are just sufficient to cover costs and provide firms with a normal return on investment. This normal return (also referred to as zero economic profits) reflects the risk on any investment needed to provide the product or service and is just sufficient to induce firms to stay in the industry but not sufficient to entice firms to enter. In addition, production occurs under the most efficient combination of inputs and the economy's resources are allocated to the most efficient uses.

There may be situations in which the market for a particular product or service deviates from the competitive norm and the competitive market does not reach its full potential. When this occurs, there is a market failure and government intervention in the market is often justified on the basis of this market failure. However, any interference in the market must be justified after considering the costs and benefits. The costs do not refer only to out-of-pocket costs but to induced changes in

the industry which result in an inefficient use of resources.

If a market failure is observed in a particular industry, the crucial question becomes the form of the government intervention. The extent of the intervention should be related to the degree of the market failure. For example, a small deviation from the competitive norm due to high costs of informing consumers suggests that any intervention should assist the competitive process by providing information. A more serious market failure may result in the scrapping of the vestiges of competition and the introduction of a regulatory process which takes price-setting power out of the hands of the industry. Therefore, the regulatory response should be in proportion to the failure. To use a blunt all-encompassing regulatory instrument, such as the establishment of a Crown Corporation, when all that is needed is a focused, small intervention, is very costly to the economy in terms of inefficient use of resources; the product will be produced and priced inefficiently.

Market failures refer to natural or inherent reasons why an industry will evolve from a competitive norm or will cease to exist. Therefore, the formation of a cartel of producers is not a market failure in our sense although it is certainly a deviation from the competitive norm.

Market failures take the following forms:

i) Transaction Costs

There are significant transaction costs facing consumers in informing themselves about the characteristics of the product of a particular firm or of another firm producing similar products. This can provide each firm with some power over price and hence result in a deviation from the competitive result. Obvious responses are to introduce minimum standards through licensing or to establish an information provider. In some cases it is conceivable that the deviations from the competitive norm are so small that even the costs of the modest intervention exceed the benefits. In this case, no intervention would be warranted.

ii) Natural Monopoly

It is suggested that in some industries, the cost structure is such that the larger the firm the lower the average or per unit costs of production. In this case, competition among firms is impossible and only one firm may be viable. This produces a monopoly under which the producer controls price and production; in addition the monopolist may prefer to operate less efficiently than a competitive firm. The result is an inefficient allocation of resources. Since entry is impossible, the natural monopolist is free from competitive pressures. The normal regulatory response is to introduce a regulatory scheme which sets prices based on costs and a return on invested capital. This procedure introduces its own inefficiencies but it is alleged that the benefits of this intervention exceed the costs.

iii) Externalities

In most markets the prices charged for a product or service reflect all the costs imposed on society in the production of the product. However, it is argued that there are situations in which the use of a product imposes costs on other parties. These costs are not reflected in the price of the product and hence the market price does not act as a deterrent to the generation of these external costs. These third party costs are called externalities and their presence has been used as a justification for government intervention. The externalities may also refer to benefits which are not factored into the product price and hence insufficient benefits will be produced since output will be too low.

An example of a cost externality is the cost imposed on other motorists when a new motorist enters a highway; this is called a congestion externality. An example of a benefit externality is the employment effects and tax benefits that occur from setting up risky businesses. The latter has been used to justify government loan guarantees on high risk business loans; these loans would not be undertaken by the private sector since the participants in this market do not value the positive externalities. There is not much evidence to justify the importance of this externality and it is used only as an example.

The purpose of this report and the underlying research is to identify whether there are market failures in the automobile insurance market which justify government intervention. If the industry is found to be competitive, then the imposition of regulations affecting pricing strategies and product development will be detrimental to the provision of automobile insurance and the use of the economy's resources.

2. Definition of the Product

The product of concern in this report is the standard Ontario automobile insurance policy and the price (i.e., premium) charged for this product. The product is an aggregate of three separate coverages each of which has specific costs to the company and premiums. Since the coverages are sold in a bundle, although specific types and levels of coverage may differ among insureds, there are common costs such as selling and administration that are not allocated to each segment.

The composite or bundled product provides protection to the insured for costs incurred along three dimensions; these are known as schedules.

i) Schedule A: Third Party Liability Coverage

This section protects the insured against liability imposed by the tort system for loss and/or damage resulting from the ownership, use or operation of the automobile, and resulting from bodily injury to or death of any person or damage to property. The minimum coverage of \$200,000 is compulsory, and excess coverage can be purchased.

The cost to the insurance company of dealing with claims on this Bodily injury and Property damage (BIPD) section in any policy year will depend upon the frequency of accidents, the dollar level of court awards and the cost of using the tort system. The actual dollar value of claims costs can increase over time with inflation and the number of drivers in the specific area. However, there also may be structural changes that will cause significant changes in observed claims costs. These include changes in the costs of using the legal system, changes in payouts on BIPD suits through the tort system and the use of a gross-up for taxation of lump-sum awards to insureds. In

addition to changes in the size of the award, the total claims costs can increase with an increase in the number of legal suits. It is anticipated that certain provisions under the Family Law Act in Ontario will increase the use of the tort system for claims of third parties (relatives). The greater the frequency of these claims, the higher are the expected claims costs.

ii) Schedule B: Accident Benefits Coverage, No-fault

Accident benefits coverage, on a no-fault basis, is provided under this section of the standard automobile insurance policy. There is compulsory coverage for medical payments, funeral expenses, disability income benefits and death benefits. The benefits are limited and for claims above this 'threshold' or scheduled value, there is access to the tort system.

Since a significant number of the claims are below the threshold value, the actual claims costs are unaffected by the cost of using the tort system and any of the structural changes noted in the discussion under Schedule A. The actual claims costs in any province will depend upon the scheduled threshold values in the province.

iii) Schedule C: Collision Coverage

The coverage under this section in Ontario is optional and can cover a wide range of specified perils. There are four levels of coverage for which an insured may obtain indemnification. The most inclusive of the coverages is the 'all perils' coverage. Collision or upset limits coverage to damage incurred in collision or upset of the vehicle. Comprehensive coverage provides indemnification for damages other than collision or upset and specified perils is a coverage limited to loss from specific events.

These coverages invariably include a deductible portion. This generates 'co-insurance' which makes the insured partially responsible for covering the cost of the damage. This may assist in generating better driving habits and ultimately lower premiums.

The cost of collision claims is affected mainly by the inflation in automobile repair and replacement costs. The costs of using the tort system to determine fault are

minimized through the use of a formula approach to define guilt in specific accidents. The result is a circumvention of the court system and thus a reduction in costs. This innovation was introduced by the insurance companies to minimize legal costs; without the formula definition of fault, it would pay an insurance company to incur legal costs to determine fault. This would be a profitable decision for the individual firm but at an aggregate level, costs (and hence premiums) would have to be sufficiently high to cover the additional legal costs. (Grubel, 1985)

For each of the three schedules there are claims costs. The actual amount of these costs is referred to as ex post claims experience. An important distinction must be made between ex ante and ex post. The level of premium set for each coverage (ignoring the common expense component) will depend upon the insurance companies, expectations of the losses to be incurred for the specific level of coverage in each section. The expectations will be based on the actual claims costs incurred and the impact on claims costs of any changes in claims payouts or frequency of law suits.

If the actual costs during the policy year are equal to the expected costs, then the insurance company will earn its level of expected profit. However, since claims costs have a random component, it is likely that ex post, the claims costs differ from their ex ante level. As will be argued in a subsequent section, this does not mean that the insurance company can increase its premiums in the future for the specified segment to recapture the loss, if the actual losses are greater than expected, or to reduce the premium if actual losses are less than expected. The premium will reflect the expected level of costs over the policy year; historical loss experience will be one factor in determining the premium.

3. Model of a Casualty Insurance Company and Implications for Performance

A very effective method to provide a framework for analysis and to understand how an economic entity operates is the use of a model; in our analysis a model is used that incorporates the major issues in the insurance market: risk and the time value of money. The model makes a number of simplifying assumptions but even so pro-

vides many relevant and important implications for the expected profitability of the underwriting and investment activities of a casualty insurance company. In addition, as some of the assumptions are relaxed, a richer set of implications are obtained.

The model is developed in the Booth paper; it evaluates the insurance contract from the viewpoint of the equityholder who is the ultimate owner. No distinction is made for joint stock or mutual companies since research results (Mathewson and Winter, Halpern and Mathewson) suggest that they behave very similarly with respect to profit maximization for equityholders (for joint stock companies) or for policyholders (for mutualized firms). The models consider first an insurance company in which there is no regulation of any kind including solvency requirements. A second model introduces solvency regulations by relating the premiums written to the amount of equity capital in the firm. Finally, the impact of corporate taxation is considered.

a) No Regulation

The first model identifies the expected profits to the equityholders of the firm from their investment in the equity of the company. The expected profit is composed of three elements: the first portion results from the investment of the equity funds in the investment portfolio of the firm; this is like the earnings generated from the investment of funds into an investment or mutual fund. The second portion represents the income generated on the 'prepayment' of premiums by the policyholder. Since premiums are collected in advance of when they are needed to pay a claim and since claims need not be paid immediately, especially if there is pending litigation, funds for investment are provided by premiums. These two sources represent investment income. The third element represents the income derived from the underwriting or insurance exposure part of the business. This expected income is equal to the difference between the premium dollars collected and the expected claims, variable and fixed costs.¹ It is important to stress that the actual profits earned by the insurance company need not equal the expected profits. If the actual values of the loss ratio, expense ratio or return on the investment portfolio differ

from the expected value, then actual profits deviate from their expected value.

Based on a well-accepted model of the valuation of risky cash flows, the model determines how the premium should be set so that the market value of equity is maximized. The model assumes that the risk from the insurance operations is diversifiable and hence there is no need to provide a rate of return on funds invested in the insurance business that exceeds the risk-free rate. This does not imply that there is no variability in the underwriting performance of the firm, however, the variability is independent of the movements in the overall economy and hence can be diversified away.

From this assumption, the premium is set such that the underwriting ratio, defined as unity minus the sum of the loss and expense ratios, is expected to be negative. Thus for every dollar of premium, the claims and expenses are in aggregate greater than one dollar. The loss is equal to the proportion of each premium dollar available for investment times the risk-free rate. The implication of this model is that the expected underwriting ratio is just offset by the investment return expected to be earned in the investment of 'free' capital generated from the writing of insurance. Therefore, it is expected that the underwriting profit earned by the insurance company on a line or on all lines should be negative.²

For example, if the interest rate is 10% and every dollar in premiums generate \$1.10 in investible funds, then the underwriting loss per dollar of premium is 11 cents (i.e., $\$1.1 \times .1$).

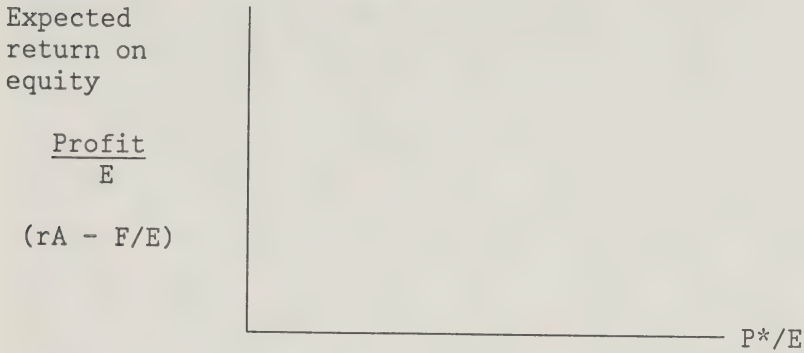
One interpretation of this result is that the purchaser of an insurance policy is pre-paying for a service. Suppose the insurance company were able to obtain these funds and not have to pay the insured for the use of the funds. The result is that the insurance company obtains funds at a zero cost and invests them to earn a positive rate of return. This profitability will draw more companies into the insurance business and, in order to attract business, the entrants will lower premiums and hence underwriting profits. The premium reductions will continue until the insured is being given credit in the premium paid of an amount equal to the risk-free rate for the use of their funds. The net result is a zero economic

profit on the underwriting business and imputed risk-free return on the investment of the premium.

Another way to look at this result is to recognize that in the model, the insurance portion of the business is totally self-financed; no equity funds are needed for the ongoing operations of the company. Since the policyholders incur no risk, their return is the risk-free rate.

Another interesting result is the role of common equity in the company. The premiums written reflect potential claims and the policyholder may be concerned that under certain circumstances there will not be sufficient funds available to pay claims. To reduce this risk the insurance company has an equity cushion to protect against catastrophic loss. There is no part of the equity that is allocated or needed for the insurance operations. Hence, there will be no return expected on equity from the basic insurance business. The equity is invested in the bond and stock investment portfolio; both the cash flow and the principal amounts may be used to pay claims. The greater the ratio of premiums to equity, the riskier is the policyholder's potential claim. In an unregulated environment the insurance company chooses the ratio of premiums written to equity based on a number of variables including underwriting variability and bankruptcy costs.

The expected rate of return on equity earned by the stockholder is composed of two parts; the first is a return on the investment in the securities portfolio less fixed costs; the second is a return to reflect the risk level accepted by the equityholder. This is portrayed in Figure 1.

FIGURE 1

The relationship portrayed in Figure 1 is

$$\text{Profit}/E = (r_A - F/E) + (r_A - r) P^*/E$$

where Profit/E = expected rate of return on equity

r_A = expected return on investment portfolio

F/E = fixed costs as a proportion of equity

r = risk-free rate

P^* = dollars generated for investment from premiums

E = equity investment

The variable P^*/E is a measure of the leverage ratio or risk accepted by the equityholder.

The implications of this model are very important. First, an underwriting loss is the expected result; an industry rule of thumb suggests a 10% loss on automobile insurance. When the imputed return from the investment income is included, the net underwriting loss is expected to be zero. The Booth report identifies net underwriting results for the Ontario automobile industry ranging from a high of 8.6% in 1982 to -12.9% in 1985. Second, as interest rates increase, the profitability of investment increases and to obtain more 'free' capital for investment, the insurance companies will lower premiums. This will increase the loss from underwriting activities and increase expense and claims ratios. Third, as the amount of funds available for investment purposes per dollar of premiums increases, the premium will fall. Thus a firm

which can slow claims settlement will have lower premiums. This provides compensation to the policyholders for the delay in settling the claim. Fourth, the insurance company is composed of two pieces -- an insurance underwriting function which is financed by premiums and an investment fund into which equity investments are placed. The amount of equity capital used is determined by the firm. The insurance company can expand its insurance side of the business without any increase in equity if it is felt that the resulting risk is tolerable. These two businesses undertaken by insurance companies lead to some confusion. The observed profitability of the insurance company usually refers to the total operation; therefore profits may be large or small or negative depending upon returns on the equity invested in the securities portfolio and the underwriting performance of the firm. It is the latter only that should be of interest in evaluating the competitiveness of the industry. The profits from the investment portfolio do not accrue to the policyholders in a joint stock company, and hence are not relevant in determining whether premiums are too high. Finally, premiums must be set based on claims costs, expenses and the imputed return on investment of the premium. Observing the net underwriting profit based on the premium, one should, on average, observe a zero value. If a firm continually has negative results, this implies that premiums have not been set properly and in a joint stock company, this would result in a reduction in stock price since the equityholders' returns are being used to pay claims. In a competitive industry the presence of continuing net underwriting losses is unlikely to occur. In a public transportation system, continuing net underwriting losses can occur and this would constitute a subsidy of drivers by taxpayers in general.

b) Solvency Regulations

The solvency regulation introduced into the model relates to the maximum permitted level of premiums per dollar equity; for example, for firms under the Federal Superintendent of Insurance, the regulation permits three dollars of premium per dollar of equity. This regulation places an upper limit on the risk to the equityholders and insureds. The result of the regulation is to tie together the underwriting and the investment decisions; they are no longer separable. For a firm to write more premiums, a

larger equity base is required. This may slow up adjustments to competitive opportunities somewhat.

The implications of this model are similar to the 'unregulated' one in that there is expected to be an underwriting loss which is expected to be offset by investment income earned on the premiums. This loss, however, is related not only to the riskless rate of interest but also to the expected ability of the portfolio investment segment to outperform the market. For example, if a company expects that it will beat the market on its investment portfolio, it will try to obtain more 'free' investment funds by reducing premiums. It will have a larger underwriting loss than a company which does not believe that it can beat the market. Therefore, premiums and underwriting losses can differ among companies based on their expected investment performance.

c) Corporate Income Taxes

The equity investment returns are taxable along with any underwriting income that is generated. Since the latter is expected to be a loss, the tax impact will be to reduce taxes on other income. The taxation of the returns on equity investment provide an interesting problem. Why would an investor purchase the equity of an insurance company and have income from investments that are taxable in the hands of the company and not purchase a mutual fund in which there is no taxation at the fund level? In order to offset this disadvantage, the premiums must be larger so as to offset the tax that must be paid. The effective tax rate is the important variable and with underwriting losses and the non-taxable status of cash flows from some financial instruments, this tax rate need not be large. In the Booth work the tax rate used is 15% as obtained from a Department of Finance estimate for financial institutions and insurance companies. Thus premiums will be higher due to the presence of the corporate income tax.

d) Further Extensions

One assumption of the model is that underwriting activities, although having variability, do not have risk since the variability can be diversified away. The diversification can arise either through multiple line writing or through the shareholder purchasing a diversified port-

folio. To the extent this diversification is unable to remove all risk, the underwriting income will have to be increased and the premium holder may have a higher return attributable to the premium.

III. COMPETITION IN THE AUTOMOBILE INSURANCE MARKET: STRUCTURE, CONDUCT AND PERFORMANCE

1. Introduction to the Methodology

The two extreme forms of market structure are perfect competition and monopoly. The former, in its usual version, requires a large number of identical producers whereas the latter usually refers to a single provider of the good or service. In the perfectly competitive model, no individual producer has market power; they each take the price as given. In the monopoly model, the monopolist has market power. The monopoly result can be obtained with many producers if they form a cartel in which the price is set at the monopoly level, each participant has a certain allocation of production and sells at the monopoly price, and there are barriers to entry. The probability of a cartel being formed and being successful depends upon the number of firms in the industry. Since there is always an incentive for each firm in the cartel to cheat by selling more than its allotment at a price slightly below the monopoly price, the cartel must be policed. The greater the number of firms in the cartel, the harder it is to identify if one firm is cheating and thus the greater the probability that the cartel will unravel. If there are no barriers to entry, the high profits will induce new entrants who when brought into the cartel increase the number of firms in the cartel and the probability of cheating. Therefore, market power is more likely to be correlated with a small number of firms and high barriers to entry since this makes the detection of cheating easier and hence the cartel is more viable.

There is a positive relationship between market power, the ability to set price above marginal cost and earn monopoly profits, and market structure. Although it is possible that a large number of firms can still form a cartel, this is unlikely. Similarly, as long as there is the potential for entry and exit, the competitive outcome can be observed in a market which has as few as two firms. These outcomes may be the exception and not the rule but

the importance of entry and exit should not be underestimated.

The structure-conduct-performance model suggests that the key to predicting performance of an industry in terms of profitability, technical progress, price determination, etc. is found in the structure of the industry. Structure includes the number of firms, their size distribution, the ease of entry and exit, the potential for joint activities and cost considerations. Conduct, which is influenced by market structure, refers to the firm's objectives, price-setting behaviour and behaviour toward rivals. This in turn generates industry performance.

As already noted, structure alone cannot determine conduct and performance. As seller concentration is increased, it is not always true that there will be collusion and market power; potential entry is sufficient to generate the competitive result. Therefore, market structure will give an important indication of market power but at its worst, will underestimate the competitive nature of the industry when entry is present.

Market structure is measured in a number of ways. The obvious method is to look at the number of firms. This approach, while giving some indication of structure, does not consider the size distribution of the firms. To accomplish this end two other measures are used; both relate to the concentration of the output of the industry. The first is called the concentration ratio and it measures the proportion of the industry output, or in the automobile insurance industry, sales, controlled by a certain number of firms. For example, C_4 is the concentration ratio for the top four firms. Although there are no theoretical values of this ratio to distinguish a competitive from a monopolistic industry, it is reasonable to infer that the potential for collusion and hence monopoly power is higher when the four firm concentration ratio is 90% than when it is 25%.

The second measure of concentration is called the Herfindahl index; this measure takes into consideration not only the relative size of the firms but also the number of firms. The Herfindahl index is defined as the sum over all firms of the square of each firm's market share. For pure monopoly, the value of the Herfindahl index is 1.0. For a perfectly competitive industry in which each

firm has the same market share, the Herfindahl index is the reciprocal of the number of firms in the industry. As the number of firms becomes larger, the value of the Herfindahl index approaches zero. For example, if there are two identically-sized firms, the index value is $1/2$. With an industry of 25 firms, the index value is .04. Since the index is based on the squared value of each firm's market share, the greater the inequality of the market shares, the closer to unity will be the value of the index.

In most applications, performance is evaluated with reference to the rate of return on equity invested in the firms within the industry. Although there are a number of theoretical problems with this measure (see Potvin), it cannot be used in the automobile insurance market for a number of other reasons. First, automobile insurance is just one of a number of lines of insurance written by casualty insurers. To identify the results of one line would require arbitrary allocations of costs and equity; the results would not make any sense. Second, if there were firms that wrote only automobile insurance, the rate of return on equity would depend upon the investment portfolio returns and the degree of financial risk, i.e., ratio of premiums to equity. Any comparisons would have to account for very different investment portfolios and financial leverage in order to obtain reasonable performance measures. These adjustments are difficult to undertake since much of the needed data is not available.

Finally, statistical evidence is consistent with the hypothesis that higher rates of return on equity are found in highly concentrated industries with significant barriers to entry. This may be due to collusion. But with the statistical problems associated with tests of the relationships we cannot conclude that high concentration necessarily results in market power. However, we can conclude that a lack of concentration is consistent with no market power.

2. Market Structure

2.1 Concentration in the Automobile Insurance Market

A standard methodology to draw inferences about the state of competition in a market is to consider the degree to which the output of an industry is controlled by a sub-

set of companies. This approach provides an indication of the degree of competitiveness; however, as is discussed in the Potvin report, the approach can underestimate the degree of competition in the model since the influence of potential competition and contestable markets is not considered. This influence is important since it can generate a competitive outcome even with a small number of firms. These concerns are addressed again later in this section.

The methodology requires the identification of the product, the extent of the market and the definition of the entity or unit of analysis.

i) Product

In section II-3 the product or standard automobile policy was defined in terms of three types of coverages: collision, accident benefits and bodily injury - personal damage. This describes the product along a particular dimension. But in this section a different concept of the product is considered; here the product reflects writing or selling the policy and administering the policy; the latter includes the risk bearing function. In some companies the writing and administration are combined; in other companies the writing is done by agents and the administration by the insurance company. Some companies, by using reinsurance, can eliminate the risk bearing function entirely.

ii) Output Measure

Conventional analyses use a measure of total revenues as a descriptor of firm size. In the automobile insurance industry the analogue would be net premiums written for the economic entity; this variable reflects the overall risk exposure of the entity since it is equal to direct premiums written less reinsurance ceded to other companies (or plus reinsurance accepted from other companies).

Unfortunately, since direct premiums written data are available for the Ontario market only, this output measure is used in the analysis. Fortunately, this measure provides information concerning the relationship between consumers and individual companies that is not available from net premiums written. The former considers the total product, i.e., the sale of the policy and its administra-

tion and risk bearing; the latter considers only cases where the entity sells and administers. For example, consider the case where a firm has \$1 million in direct premiums written but reinsures the total amount. The net premiums written are zero. Should this entity be eliminated from the analyses of the competitive structure of the industry? By using net premiums written this firm is eliminated and there is an underestimate of the degree of competition in the market. Using direct premiums written includes the firm and provides a better indication of the competitive structure of the industry.

iii) Definition of the Market

The automobile insurance market is really composed of a number of sub-markets such as taxicabs, long distance trucking, small towns, etc. These markets may be different from the overall automobile insurance market and a competitive result in the overall market may not be replicated in the sub-markets where the choice of companies is limited. Since the data on the sub-markets is limited, the empirical analyses on market structure will apply to insurance for non-commercial drivers who have access to brokers and agents. A discussion of sub-markets is left to a subsequent section.

iv) Economic Entity

Although a natural measure of the economic entity in the analysis is the individual firm, the existence of a group of companies with a common owner, suggests that the individual firm is not the locus of pricing decisions. Therefore, the entity in the analysis is the group which is defined as the collection of all insurance companies with the same owner. To highlight the difference, in 1984 there were 157 individual companies writing automobile insurance; this was equivalent to 112 groups.

v) Empirical Results

The number of economic entities involved in the writing of automobile insurance in the Ontario market is large; in 1984 there were 107 groups. The numbers from 1974 to 1984 averaged 113 with a high of 136 in 1974 and a low of 104 in 1983. Thus while entry and exit occur, there is overall stability.

To determine the influence of each group in the market, its share in the automobile insurance direct premiums written was calculated; the entities are then ranked from highest to lowest market share. One striking observation is the continued existence of large and small entities. For example, in 1984 the largest entity, Co-operators Insurance, had 9.39% of the market. The company ranked 20th, Gore Mutual, had 1.6%. As the rank of the company fell, the associated market share became very small.

One interesting feature of the market shares was their stability over time. For example, considering the top ten companies in 1984, 7 were in the top ten in 1979 and 9 were in the top ten in 1974. This does not mean that there were no substantial changes in rankings; Safeco which was ranked 10th in 1984 had rankings of 26 and 25 in 1974 and 1979 respectively.

For the companies ranked 11 to 20, there was more movement. For example, considering the top ten ranked entities in 1984, the average increase in rank for these companies from 1974 to 1984 was 1.6 with a standard deviation of 5.7. However, for the entities ranked 10 to 20 in 1984, the average change in rank from ranking in 1974 was 5.9 with a standard deviation of 13.4. This suggests that it was easier to 'crack' into the 10 to 20 rank than to enter the top ten ranking.

Finally, a relationship of market shares of each entity for 1984 and 1974 demonstrated that large firms maintained their market shares over the period. Sub-period estimates found that large firms increased their market shares over the period 1974 to 1978 and then lost these shares over 1979 to 1984. However, the overall result is that large firms tended to stay large.

This conclusion of relative stability in market share for the top ten firms is not inconsistent with a competitive market where the reputation of the firm is an important element in the sale of the policy. Since the purchaser of automobile insurance is concerned that the firm will be financially able to meet a potential claim, the reputation of the company is important. One element in this reputation is the length of time the firm has been in business. Thus, a new firm may have difficulty in generating substantial amounts of new business. Rapid growth may be available only through merger or acquisitions.

However, the industry can still be competitive even with the existence of reputation impacts. More will be said on this topic in a subsequent section.

Another method of evaluating the structure of the industry is to consider concentration ratios. A number of these ratios can be constructed. The most frequently used is the Concentration Ratio (CR) which identifies the cumulative market share of a prescribed number of entities. Therefore, CR_4 is the four firm concentration ratio and is measured by the aggregate market share of the top four companies. Clearly the larger the market share concentrated in a few firms, the more likely is cartel behaviour and hence monopoly pricing.

Another measure of concentration is the Herfindahl index which is measured as the sum of the squared value of the market share for each entity in the market. This measure reflects both the number of firms in the industry and the inequality of the size distribution of firms. If the industry is a monopoly, the Herfindahl measure (H) is equal to unity. If it is perfectly competitive and there are a large number of firms its value approaches zero. To provide an intuitive feel for the Herfindahl measure a number equivalent is often provided (NE). This statistic is equal to the number of equally sized companies that would generate the observed H measure. The larger the NE the more likely is the industry to be competitive.

All of these concentration measures provide an indication of the structure and hence the competitive nature of the industry.

In Table 1 concentration measures for the Ontario automobile insurance market are presented for the years 1974, 1979 and 1984. To assist in understanding this table the entries for 1984 are interpreted as follows: C_4 - the top four firms wrote 27.8% of the direct premiums written; C_8 - the top eight firms wrote 44.5%; C_{20} - the top 20 firms wrote 74%. The Herfindahl index had a value of .0370 which is equivalent to 27 entities of equal size.

TABLE 1

Measures of Concentration in Automobile Industry

Year	C_4	C_8	C_{20}	H	NE ^(a)
1974	27.4%	42.6%	66.6%	.0325	30.8
1979	36.9	55.8	83.5	.0559	17.9
1984	27.8	44.5	74.0	.0370	27.0

(a) Calculated as $1/H$.

Source: Figure 9, Potvin Study

There are a number of important observations from these concentration measures. First, all measures indicate that concentration increased from 1974 to 1979 and then fell such that the 1984 values are approximately the same as found in 1974. The slightly higher value of H in 1984 compared to 1974 reflects the increased value in 1984 over 1974 of C_{20} i.e., slightly higher inequality in 1984. Second, the Herfindahl measure is quite small and close to a value of zero found in a competitive industry. Thus the industry structure is consistent with a competitive industry.

Another way to evaluate the structure of this industry is to compare the concentration measures with those found in other markets. This comparison is made in the Potvin study, Figure 13, where concentration ratios for 20 industries are presented for 1980. These ratios are based on a national and not a provincial market; the larger the market considered, the greater the number of firms and hence the lower should be the concentration ratios. Therefore, there is a bias in the comparison of a provincial market to products in a national market toward showing the former to be less competitive.

For the selected Canadian industries, a comparison with the 1980 concentration measures for the Ontario automobile insurance industry generates the following results:

1. H : Only eight of the twenty industries had an H measure lower than that of the Ontario automobile insurance industry.
2. CR₄ : Eight of twenty-two industries have a lower value of the 4 firm concentration ratio.
3. CR₈ : Nine of twenty-two industries have a lower value of the 8 firm ratio.
4. CR₂₀ : Ten of twenty industries have a lower value of the 20 firm ratio.

The conclusions of these comparisons are unambiguous: the structure of the Ontario automobile industry is more competitive than that of a number of Canadian industries. This conclusion is reinforced by the inherent bias against a competitive structure in a smaller geographic market.

Therefore, the analysis of the structure of the market is consistent with a competitive industry. The large numbers and the size distribution of the firms make collusion very unlikely. A similar conclusion was presented by Mathewson and Winter in their analysis of the Canadian general insurance market in total and for specific lines of insurance in a national market. As noted in a previous discussion, this type of structure analysis underestimates the degree of competition in an industry since it does not take into consideration the influence of potential competition; it is the threat of entry when profits are large that can maintain competition in an industry. The influence of potential competition is investigated in more depth when barriers to entry or exit are considered.

vi) Sub-markets

Although the overall Ontario automobile insurance industry is competitive, this may not be the case for sub-markets in the province. In these smaller markets, drivers may not have access to the large number of companies writing insurance. Hence, it is possible that monopoly characteristics are found in these sub-markets. The sub-markets normally considered are taxicabs, long-distance trucking, and high-risk drivers. In addition, it is also alleged that drivers in small towns have restricted access to companies writing insurance and hence pay monopoly prices. We will consider each area in turn.

a) High-Risk Drivers

In a number of the sub-markets, there has been a substantial increase in premium levels and in many cases members of these sub-markets are insured by the Facility Association. This Association is a non-profit organization of insurers which provides insurance to owners and operators of motor vehicles who may have trouble obtaining insurance from a specific carrier.

The groups that make use of the Facility provide us with some indication of the sub-markets that may face non-competitive pricing. In terms of share of total premiums in a sub-market insured by the Facility, the major users in 1986 of the Facility Association are taxicabs (46%), interurban trucking (23.5%), public buses (15.1%) and funeral vehicles and ambulances (10.1%). In terms of growth over the period 1982 to 1986, major increases in market share insured by the Facility are observed in the same groups. In terms of vehicles insured by vehicle class, the major user is motorcycles where 22% of the vehicles are insured by the Facility; this proportion has remained reasonably stable from 1982 to 1986. Some growth in the share of vehicles insured was found in snow and commercial vehicles.

From these observations, it appears that potential problems of non-competitive pricing could be observed in the taxicab, interurban trucking and public bus sub-markets where choice of insurance company is limited.

It is important to recognize that increasing premiums, reduced coverages or increased use of the Facility does not necessarily represent the response of a monopolistic industry. As will be discussed in a subsequent section on performance of the insurance industry, increasing losses and uncertainty concerning damage awards can generate the behaviour observed for these sub-markets even if they are competitive. It is more than a coincidence that the sub-markets for which the Facility has become more important are areas in which there are high risks and the potential for high third party claims.

As an example of the kinds of problems that insurers face, it was reported in the Toronto Star that over the past three years \$19 million in premiums were collected from the Toronto taxi industry and \$38 million were paid

out in claims. This makes writing insurance for taxicabs very costly. A related problem regarding long distance trucking to the U.S. forces a number of the truckers into the Facility. The court awards on bodily injury and property damage are very high in the U.S. and thus the expected claims are also high. Therefore, insurance companies have required these drivers to use the Facility.

The suggestions that the insurance companies' behaviour in this market reflects their monopoly power misses the important issue of potential competition from a number of sources. If the premiums charged by existing firms or the Facility are too high then a number of competitive responses are possible: these include entry into this sub-market by firms not currently engaged in writing policies for this market; entry of a new firm to serve the market; and the formation of a mutual company of individuals affected in the particular market. For example, if taxicab owners believe that they are being charged monopoly prices or not given adequate coverage, then they can set up an insurance company or facility which provides insurance at a lower price. In fact, the existence of a competitive reinsurance market would assist in this response to perceived monopoly pricing.

Therefore, provided there are no barriers to entry (and exit), monopoly pricing in a particular sub-market cannot be sustained. It is this potential competition that will force existing companies within the sub-market to consider whether or not the premiums charged will be sufficiently high to attract entry.

b) Small Towns

The second general area of concern is that sub-market composed of small towns. Here, it is alleged, that automobile owners are limited in their choice of insurance companies; the observation leading to this conclusion is that there may be only one insurance broker in a small town or perhaps an agent of a company that uses direct writing.

Casual empiricism suggests that the number of brokers in a small town is small; this represents the size of the local market. However, this does not necessarily imply that premium levels will be set at monopoly levels. Individuals looking for insurance coverage may find alternative coverage by shopping further afield to adjacent

towns. Also, the broker who represents a set of insurance companies should be able to find those companies which provide the coverage at competitive prices. It may be that any problems in small towns may be more a result of the single broker in a town and not the state of competition in the automobile insurance industry.

2.2 Rating Bureaus

In the preceding section the conclusion was that the structure of the automobile insurance market in Ontario and in fact the insurance industry in general was consistent with a competitive industry. Perhaps monopoly elements can arise from cartel behaviour; one mechanism that has been suggested as a vehicle to assist in collusive behaviour is the rating bureau.

In an industry in which reliable information on claims experience is crucial for rate making purposes, the rating bureau can provide an important service. By pooling information on loss experience for a class of insureds or for a particular region, the credibility and reliability of the data are better than the observations of the claims experience of any one company. By pooling the information the random elements observed for any one company's loss experience are reduced or eliminated. Since the information must be collected over a number of companies and over a number of different risks, there is a necessity to have standardized products; to the extent that a product is unique to a firm or to a small number of firms, the pooled information may still not provide enough observations to eliminate random elements.

Not only does the rating bureau provide information but it also publishes recommended rates based on a particular formula. For example, the Insurers Advisory Organization publishes recommended rates for automobile insurance based on target expense and loss ratios. It is this combination of information provision and published rates which could lead to the conclusion that the rating bureaus facilitate monopolistic pricing.

This concern, however, does not appear to have any grounding in fact for a number of reasons. First, to be effective as a cartel/monopoly where the price is set above marginal cost so as to generate monopoly profits, there must be a mechanism to allocate market shares and

ensure that members of the cartel do not cheat. There are no mechanisms of this type found in the rating bureau structure. Second, there is no requirement that the members of the rating bureau use the recommended rates. The companies may belong to the bureau to obtain the claims experience information which is then applied to their own rate making formula. Third, not all companies in the insurance industry are members of a rating bureau. Some companies are either large enough to generate reliable claims experience on their own or have access to this data from other sources.

Therefore, without any power to enforce cartel behaviour and collusive pricing, rating bureaus, such as the IAO, cannot facilitate collusion among insurers. One side effect of the rating bureau structure is that there may be an impact on innovation; since data is pooled on standardized products, small companies which cannot obtain their own reliable set of data on new products may be unwilling to innovate. However, this does not suggest that innovation in defining risk categories does not occur.

2.3 Barriers to Entry

The continued existence of a monopoly depends crucially on the ability of the monopolist or the cartel to deter firms from entering the industry. The entrant can charge prices just under those charged by the monopolist and earn above competitive profits. To the extent entry is inhibited either by the basic structure of the industry or by external factors, a monopolist can overcharge, underproduce and operate inefficiently relative to the situation in a competitive industry.

Freedom of entry is central to the concept of 'contestable markets' under which it is possible to have a competitive industry with as few as two companies. A contestable market is one in which there can be costless hit-and-run entry i.e., all firms, incumbents and potential entrants face the same costs; there are no sunk costs of entry; and entry can occur before incumbents have time to respond. These conditions result in the incumbent having no advantage over the entrant. If an advantage exists, there is a barrier to entry and there is the potential for a non-competitive solution. Given the large number of firms in the Ontario automobile insurance industry and observed entry and exit (see Section

III-2.3.c), it is unlikely that significant barriers to entry or exit exist. We now turn to the potential sources of these barriers and evaluate their importance.

Barriers to entry arise from two general sources: those that are imposed externally or due to the nature of the product and those that are inherent in the costs of producing the product. The former include:

- i) government regulations concerning capital requirements
- ii) sunk or irrecoverable costs of forming reputation
- iii) brokerage system
- iv) monopoly reinsurance market.

The latter include economies of scale which implies that per unit costs are smaller as output grows; also there are economies of scope where it is cheaper for a firm to write insurance in a number of lines than just in a single line. The findings on economies of scale and scope are of direct relevance to the issue of public versus private provision of automobile insurance.

A. External Barriers

i) Government Regulations

Regulations can inhibit entry by conferring advantages on the incumbents or increasing the cost of entry. Minimum capital and surplus requirements, securities deposits and a maximum ratio of premiums written to equity capital are the operable regulatory constraints.

There is no evidence that these requirements inhibit entry since they apply equally to new and incumbent firms. The minimum capital and surplus requirement of at least \$1,000,000 is not a sum that is difficult to raise in the capital market.

ii) Sunk Costs and Reputation Effects

Incumbent firms in the industry have made significant investments in firm specific assets which are sunk costs.

These investments include the establishment of a distribution system, either using brokers or agents, initial market surveys to determine profitable market segments and the establishment of a reputation. The latter is important for a product in which it is difficult to evaluate the credibility of the supplier until the service is required. In the automobile insurance industry the reputation concerns the viability of the firm to service the clients' claims in the event this is necessary. The company makes investments in assets to signal that it is indeed viable. The investments include the costs to attract brokers, perhaps including reduced prices, and the costs of interesting brokers of good reputations to represent their product along with others.

While these investments in establishing a reputation are sunk costs to the incumbent, they are incremental costs to the potential entrant and if undertaken would be lost upon exit. The existence of these sunk costs suggests the possibility for a barrier to entry.

The significance of this factor in generating a meaningful barrier to entry is quite small for a number of reasons. First, the solvency requirements provide some guarantee of the credibility of the insurance company to pay claims. Second, new entry into the Ontario automobile insurance market can be accomplished by existing firms which have not written automobile insurance in Ontario but are established and known to agents and consumers through coverages written in other lines. These companies need not just be Canadian but entry can be by British or other foreign companies who already have the needed reputation. Third, reputation and signals of quality need to be directed primarily to the independent brokers and not the public. The former are familiar with the reputations of other companies writing in other lines.

iii) Brokerage/Agency System

The retailing function in automobile insurance is done either directly by the company using agents who sell only the company's product or indirectly through the use of independent insurance brokers. The brokers represent a number of insurance companies and their compensation in 1985 was approximately 11.5% of the premiums written. The brokers incur a number of costs in retailing the product; these include the general administrative costs of running

the brokerage business, costs of servicing new clients -- insurance lapses and insureds, search for new companies; and evaluating and allocating insureds to the appropriate risk rating category. The continued representation by a broker of a particular insurance company will depend upon the broker's ability to classify correctly the insureds into risk classes.

Is the retail part of the business represented by the independent brokers competitive? If not, then premiums would be high to reflect non-competitive returns being earned by the brokers.

There are some indications that appear consistent with restricted entry into the brokerage area and hence a reduction in potential competition. The first indication of restricted entry is the powers assigned to the Registered Insurance Brokers of Ontario (RIBO) to interpret and administer the rules under the Registered Insurance Brokers Act. The RIBO have become a self-regulating organization. Many of the rules of the Act have the effect of reducing competition in the brokerage business. These rules include the prohibition of automobile dealers or perhaps even other financial institutions from offering brokerage services to their clients. Also, part-time employees are not permitted to act as insurance brokers.

The second source of restrictions on entry is the regulation of brokerage companies. These companies must have errors and omissions and fidelity insurance coverage; this is in itself not a barrier to entry. There are restrictions on advertising by brokers; this clearly confers a benefit on existing companies since an entrant will have a difficult time in becoming known. Finally, the majority of brokerage companies' shares must be held by registered insurance intermediaries although a "grandfather" clause exempts pre-1981 companies. This reduces the flexibility of entrants in raising capital.

Although these regulations appear to restrict competition, is this true? If brokers were earning monopoly returns, then we would expect to observe an increase in the use of direct writing through agents representing a firm unless direct writing were a more expensive alternative. Since both the brokerage system and direct writing coexist, we can conclude only that the costs of these alternatives at the margin are equal. This does not mean

that the systems are efficient in the delivery of services.

iv) Reinsurance Markets

An important element in the insurance industry is the market for reinsurance. This market facilitates entry, exit and risk bearing by purchasing insurance contracts from firms that write them or buy re-selling contracts to firms that wish to increase the number of policies they hold. If the reinsurance market is competitive, then new firms can enter and sell insurance and then reinsure. A monopoly reinsurance market would purchase insurance contracts at a monopoly price and an entrant would be unable to compete with an existing firm which does not use the reinsurance market heavily.

An analysis of the automobile reinsurance market suggests that while it is more concentrated than the automobile insurance market, the structure is consistent with a competitive industry. The concentration ratios are as follows:

C_4	:	46.89%
C_8	:	67.59%
C_{20}	:	92.65%
H	:	.0805

Number Equivalent: 12.4

The Herfindahl index is sufficiently close to zero to be consistent with a competitive industry; and the numbers equivalents suggests that collusion would be difficult to initiate and maintain.

B. Internal Barriers

i) Economies of Scale and Scope

a) Theory

The cost structure of the industry will have a crucial influence on the number of financially viable firms and on the state of competition in the industry. Consider a one product industry where the cost conditions are such that

as the output of a firm increases the average cost (i.e., total cost per unit of output) falls. If the average costs continue to fall as output increases then only one firm will exist in the industry. Any firm which enters and has a lower output than the incumbent will face higher costs and thus will not be viable. This is an example of a market failure described as a natural monopoly; only one firm will survive since it can always produce more cheaply than the entrant. This natural monopoly argument is often used as a rationale for rate regulation of an industry or for the establishment of a government monopoly through a Crown Corporation.

The cost conditions associated with a natural monopoly are the exception, not the rule. Under normal circumstances the average costs will decrease as output increases, then level off, and perhaps rise as output subsequently increases. The average cost curve is presented in Figure 2. The output value labelled A is called the minimum efficient scale (MES). It represents that minimum level of output at which average costs reach their lowest point. New entrants, in order to avoid a competitive disadvantage, would want to enter at outputs no smaller than A. Notice that between points A and B firms of different sizes have the same average costs; therefore the industry will have viable firms of different sizes. However, the cost structure of the industry would suggest that firms do not want to have outputs greater than B. It is possible that there is no point beyond which average costs increase and the cost curve would not place a limit on firm size.

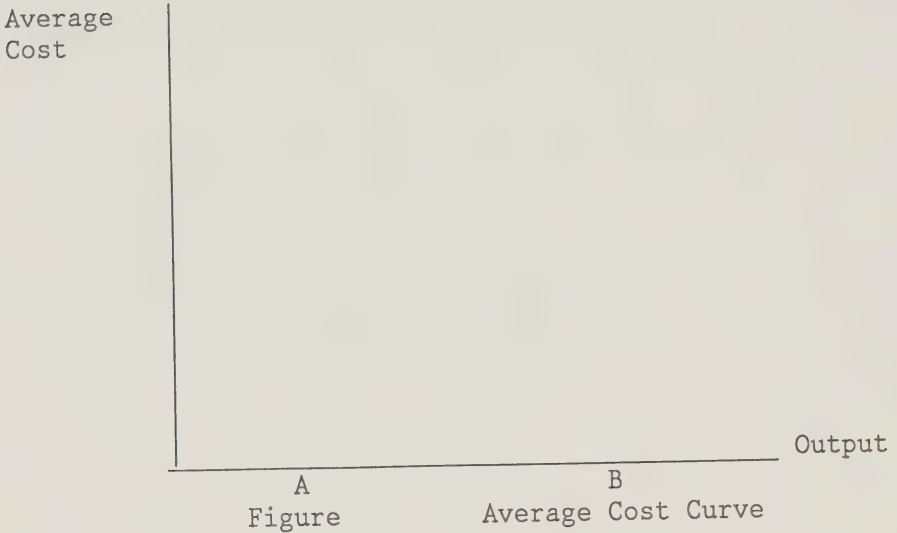
The 'barrier to entry' here is the minimum efficient scale and in some industries this could be large relative to the size of the industry. As we will see in the subsequent sections, the result of the empirical analysis and the observed entry experience in the Ontario automobile insurance industry suggest that the MES is not a barrier to entry.

Economies of scale refer only to the impact on average costs as the output of a particular product increases. However, many firms produce multiple products or even if only one product is made, the firm may produce different qualities of the product. In these instances economies of scale become difficult to investigate since there may be interactions among the production processes of each product and any fixed costs can be spread over more products,

each of which may be produced in small quantities. This is an alternative to the spreading of fixed costs over larger output size as with economies of scale.

FIGURE 2

Average Cost Curve



The interactions among products is referred to as economies of scope. Economies of scope are said to exist if the marginal cost of producing a particular product is affected by increasing the output of another product. Thus, an increase in output of one product or even the introduction of a new product will reduce the marginal cost of producing another product. In the insurance context the marginal cost of writing more automobile insurance coverage depends upon the existence of other lines of insurance. Also, entry into the automobile insurance line may reduce the costs in other lines. The interactions result in a firm choosing not only the product mix but also the output within each product. If economies of scope do exist, then the removal of a particular line of insurance will increase the cost of producing insurance in other lines as well as increasing the costs of producing in the line which is separated.

b) Empirical Evidence

An investigation of economies of scale was undertaken in the Potvin study using the conventional analysis of relating the total costs of providing insurance to the net premiums earned in the automobile, personal and commercial lines of insurance. The sample reflects companies which typically write in more than one line of insurance. The total cost of the entity is equal to the sum of agency costs, claims settlement and processing, underwriting and policy processing and general administration.

The econometric model attempted to find whether there were economies of scale in the three insurance lines identified above. In addition, the analysis identified whether there were any fixed costs that could be spread over lines or larger outputs. With fixed costs, the average cost will decrease as outputs increase.

The econometric model was unable to detect economies of scope or economies of scale in the automobile insurance line. The test concerning economies of scope is somewhat restricted since it did not take into consideration the influence of increasing output in one line on the costs of providing insurance in another line.

The observed entry experience in the automobile insurance industry is consistent with there being no economies of scale in automobile insurance. However, the existence of multiple line insurance operations suggests the presence of economies of scope.

There are some methodological criticisms of the use of cross-sectional data of costs and output to estimate cost functions and derive economies of scale. The criticisms refer to the use of accounting data combined with random variability in output. These models result in finding economies of scale where none exist.

A methodology which corrects for these problems was used in a paper by Halpern and Mathewson. The paper uses data which is dated (1965 to 1969) but given that the industry structure has not changed dramatically since then, the results should be indicative of the underlying structure of the industry.

Some of the results of direct relevance to the issues considered in this report are as follows:

- i) no significant economies of scale exist for either joint stock or mutual companies in automobile, fire and residual lines.
- ii) no significant economies of scope exist for joint stock companies, but they do exist for mutual companies when jointly writing additional automobile and combined fire - personal injury.
- iii) both types of firms realize cost savings by increasing the number of lines of insurance that they write. This is a gain obtained through more effective risk diversification by writing across lines whose claims experience is not perfectly correlated.

Therefore, these results combined with those from the cost curve regressions suggest benefits may exist from multiple line writing but not from increases in the size of any one line of insurance. This implies that there is no cost or natural monopoly justification for establishing a government-owned monopoly in the Ontario automobile insurance. In addition, by setting up the single line monopoly seller of automobile insurance, any gains from economies of scope will be dissipated; this would result in an upward pressure on expenses and premiums for the Crown Corporation.

C) Entry and Exit Experience

From the analysis of the external and internal barriers to entry, it appears that any barriers that exist are minor and will not have any impact on entry or exit. Therefore, the influence of actual or potential entry will be sufficient to generate competitive pricing in the Ontario automobile insurance industry. Also, since economies of scope and not scale predominate, entry of all sizes is likely to be observed.

Empirical evidence presented in the Potvin study on observed entry and exit in the Ontario automobile insurance market is consistent with the absence of barriers to entry. Over the period 1975 to 1984, 67 groups entered this market while 87 left. Entrants' size, on average

over the period, as measured by direct premiums written, was \$1.5 million with a large range over the years; for exit, the average size was \$1.1 million but the range was smaller. Looking at the number of entrants, the annual average for the period was 6.7 groups for entrants and 8.7 for groups departing the industry.

With the small entry size, it is very likely that any fixed costs that had to be covered were already covered through operations in other lines of insurance or in other jurisdictions.

2.4 Performance

Having observed the structure of the Ontario automobile insurance market and drawn some conclusions, we now turn to the issue of the performance of the industry. Performance is evaluated to determine whether it is consistent with competitive or monopoly behaviour.

The conventional measures of performance cannot be used, unfortunately. Normally profit rates on equity of the firm are evaluated, however, most firms writing automobile insurance in Ontario also write across Canada and are involved in other lines in Ontario as well as in the rest of Canada. Therefore, the observed profit rates on equity of the firm do not reflect competitive conditions in automobile insurance but in all of the lines. A further problem is that the companies have different product mixes and hence it is difficult to pull out the contribution of any one line. Finally, there are a number of common costs that would have to be allocated arbitrarily in order to measure profitability by line. Due to these problems, a different approach will be used.

First, there will be an analysis of performance at an Ontario aggregate level. Performance will be evaluated by determining whether the increases in premiums observed over the recent years are justified by underlying cost considerations. In this analysis a comparison of Ontario and other provinces with private insurance industries will be undertaken.

An implication of a competitive market is that the underwriting profits adjusted for imputed investment returns on premiums should be, on average, zero. This arises since in a competitive industry, the premium

charged to the insured will reflect an imputed riskless rate of return. These adjusted underwriting profits are evaluated and found to average zero.

The results from these analyses at the aggregate level are that the performance of the industry is consistent with the competitive model. The increases in premiums in Ontario both in absolute value and relative to other provinces reflect the basic underlying differences between the jurisdictions. The major difference among the provinces is the very large increase in third party liability average costs per vehicle insured in Ontario relative to the other jurisdictions.

The second approach is to evaluate performance at a disaggregated or firm specific level. Although we will not investigate premium setting policies for individual companies, there are some implications from the competitive model described in Section III-1 and standard competitive theory. First, the premiums will reflect the marginal cost of providing service. The insurance market is really a collection of sub-markets each of which differ in their risk and hence in the cost of providing service. In a competitive industry, the market participants will attempt to find reliable variables to distinguish among the insureds so as to price according to risk. Therefore, one implication is that in the competitive market there will be a complex and costly method of sorting insureds into the appropriate risk class; premiums will then be based on these risk levels. Second, the premiums charged for a given risk class will not be the same across firms. The actual premium depends upon the expense ratio, expected loss ratios and expected profitability from investment; the values of these variables need not be the same for each company even within the same risk class. In fact, companies may try to subdivide a particular risk class and write insurance only for the less risky in the class; this results in a lower premium than for firms which do not distinguish among participants in the risk class.

The observed spread of premiums across risk classes and even within a risk class across companies and the complexity of the mechanism to sort insureds is consistent with a competitive industry. In fact, only a monopolist which could prevent entry would be able to charge a single price for insurance; the publicly-owned system would be an

example. By charging an average price for insurance, the lower than average risk groups subsidize those that are riskier than average. In addition, there is a perverse incentive to encourage risky drivers and discourage drivers that are less risky than average. More on this topic will be presented in part B of this section.

A. Aggregate Performance

i) Claims Costs

As noted in the description of the basic insurance policy, there are three parts -- third party liability (bodily injury and property damage), personal accident benefits, and collision. Each element has claims associated with it and there are significant differences in the time pattern of each of these claims.

The loss ratio (direct losses and adjustments divided by net premiums written) for the total product has increased drastically in Ontario from the 1981 value of .845 to the 1986 value of 1.003. Since the collision loss ratio has been reasonably stable and the loss ratio for personal accident, although increasing, is such a small portion of the total product, any increase in the overall loss ratio reflects the influence of third party liability. The loss ratio for the BIPD element increased from 88.3 in 1980 to 123.3 in 1985.

This pattern for the elements of the standard policy in Ontario appears to be replicated in other provinces with private insurance schemes. The BIPD element grew fastest in Ontario but other provinces are catching up.

The implication is that premiums levels must increase to reflect the increasing losses. This increase is not to provide retroactive compensation for past losses but to reflect expectations of future losses. Any attempt by a firm to increase premiums above a competitive level to recover past losses will induce entry; the result would be pressure to reduce premiums to the competitive level.

Another way to view this issue is to look at the pure premiums for each element of the policy and for the overall policy for Ontario and other private insurance provinces. The pure premium for a coverage classification is calculated as the product of the frequency of a claim in a

particular coverage classification and the average cost of settling a claim in that class. This product reflects the expected claims cost for the coverage class and is one element in setting the premium. Note that the premium not only must also include expenses and an imputation for investment income and the current expectations of claims frequency and claims costs. Using the observed values of these latter two variables gives an historical pure premium. Unless current expectations are equal to historical values, the expected pure premium will differ from the historical value. Since expectations are built on historical experience, the historical pure premium will provide information on the reason for an increase in premiums.

In all the provinces investigated, claims frequency for BIPD, personal accident benefits, and collision have not changed over the period 1982 to 1986. In terms of claim frequency, Ontario has either the highest or among the highest in all three elements of the policy. For example, for third party liability, the Ontario frequency is 5.8%, i.e., 5.8 cars out of 100 each year will be involved in an accident resulting in a BIPD claim.

The claims cost element, however, has undergone major changes over time. In Ontario the claims cost for third party liability increased by 70% from 1982 to 1986; personal accident and collision both had more modest increases over the same period. In terms of actual claims costs, for the average over the period 1982 to 1986, Ontario had the highest value of \$4126 in BIPD, the highest (excluding Quebec) of \$2242 in personal accident benefits and the lowest in Canada for collision. The latter could reflect the size of deductibles which may differ in Ontario relative to other provinces.

To highlight the problems faced by the automobile insurance industry, consider Table 2. Here the pure premiums for Ontario, Alberta and Nova Scotia are presented for the three coverages. Two values are presented for the pure premium -- the value based on the 1982-6 average and on 1986 alone. From this table it is observed that the major contributor to the large size of the pure premium in Ontario is the third party portion. Based on the average experience, the Ontario pure premium is approximately \$90 above the value in any other province; for 1986 the comparable value is \$110.

TABLE 2Pure Premiums

<u>Average 1982-6</u>	<u>Ontario</u>	<u>Alberta</u>	<u>Nova Scotia</u>
Third Party	\$238.1	\$150.2	\$120.6
Personal Accident	27.0	9.1	8.7
Collision	<u>101.8</u>	<u>111.5</u>	<u>112.7</u>
Pure Premium - Average	\$366.9	\$270.8	\$242.0
Pure Premium - 1986	442.1	318.9	296.3

Based on this average experience over all risk categories in a province, it appears that in Ontario premiums should be higher to reflect higher expected loss costs. Any differences in the growth in premiums across provinces is most likely due to the relative growth in the claims costs for third party.

The BIPD element has grown dramatically in line with the increase in the size of court awards. Even though the Supreme Court of Canada in 1978 capped the pain and suffering awards at \$100,000 (inflated), there have been a significant number of court cases which resulted in large (by Canadian standards) payouts.

In addition to the actual awards, there is the expectation that awards will continue to rise and that the frequency of cases with their attendant court costs will increase with enabling provisions in the Ontario Family Law Reform Act. Finally, gross-up provisions for income tax liability have increased the size of the awards relative to structured awards with annual payouts. It has been suggested that in a lump sum award of \$7 million, \$3 million is the provision for income tax.

Given the uncertainty of the direction in which courts will move in terms of awards, along with the other factors noted, a rational and competitive insurance company will increase its expectations of claims costs and hence increase its premiums. Since the premiums are based on expected claims costs and changes in expectations need not

be related dollar for dollar with realized claims cost changes, the increase in premiums can be greater than the observed increase in observed claims costs.

A recent decision in the Manitoba Court of Appeals resulted in the reduction in an award to \$771,000 from \$2.2 million. This decision generated a substantial amount of debate and whether or not it is a harbinger of reduced future awards cannot be determined at this time.

Finally, the high Ontario claims costs on BIPD are reflected in premium rates on interprovincial buses or trucks which operate in Ontario but are insured in other provinces. In order to reflect the higher expected pure premium resulting from operations in Ontario, a higher premium is charged, even though the main operations of the insured vehicles are in provinces other than Ontario.

ii) Expense Ratios

Another element in setting premiums is the expense ratio which reflects the fixed and variable costs in writing insurance. In identifying expense ratios for automobile insurance alone, there is a serious problem of allocating common costs for firms that write in more than one line of insurance. Any allocation must be arbitrary.

The expense ratios for 1985 are compared for all provinces which have private automobile insurance. The expense ratios include agency acquisition expenses, underwriting policy processing, claims settlement and external adjustment for underwriting settlement and adjustment. For all provinces the total expense ratio was approximately the same with a value of about 36%. Although there are some provincial differences observed in the size of each component in the overall expense ratio, these are not substantial. Therefore, expense ratios do not contribute to different premiums across the provinces.

There is one interesting implication of the use of expense ratios in setting premiums. By applying a constant expense ratio to an increasing premium, the implied expenses associated with the policy increase. Thus, it appears that higher risk policies have higher expenses. While this may be true since agents or brokers need to make a more in-depth evaluation, it is unlikely that the expenses increase in proportion. It is more likely that

there is a fixed cost element. A direct estimate of the expenses may be preferable to the use of the expense ratio.

iii) Underwriting Performance

The final aspect of performance is the value of the underwriting income. As identified in the insurance model in Section II-3, there should be an attribution of investment income to the underwriting profit or loss to reflect the fact that in a competitive industry the insured should earn a return on money invested when acquiring a policy. The imputed return is the risk-free rate since there is no systematic risk in the automobile insurance industry. With the imputed return taken into account, there should be a zero rate of return on the underwriting part of the insurance business.

The Booth paper provides a methodology to measure the imputed investment income. In Table 3 below the overall underwriting performance for the Ontario automobile insurance industry is presented. This is only a rough measure since the investment income is based on the results for all casualty companies.

Looking first at the underwriting profit we observe that the average value was .005 or a loss of 5 cents per \$100 of premiums. The values in 1981 and 1982 were high, about 7 to 9 cents, but have fallen dramatically in 1984 to 1985 where losses are observed. The losses are from a combination of sharply increasing loss ratios and reduced investment income as interest rates fell. The increased claims ratio suggests that the firms were surprised by the size of the losses and premiums were set too low. Another explanation is that interest rates were high and premiums were reduced to reflect imputed return to policyholders.

In the 1981-2 period substantial investment income was earned with high nominal interest rates, which would keep policy premiums down. But as time passed the interest rates fell and this, along with increased loss ratios, resulted in poor overall performance.

To conclude this section, the industry appears to exhibit behaviour that is consistent with a competitive industry. The overall underwriting performance over the 1982-85 period is negative and small on average although

variation over time in this profit can be substantial. This reflects the major differences that can arise between expectations and realizations of the crucial variables. Also, overall premiums were consistent with the underlying structure of expected costs. Throughout the period, there was no influence on profits or premiums from changing expense ratios.

TABLE 3

Elements of Performance - Automobile Insurance

	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>Average</u>
Claims or Loss Ratio	.845	.805	.839	.952	1.007	.890
Expense Ratio ^{a)}	.246	.242	.250	.259	.243	.248
Investment Income ^{b)} \$/NPE	.159	.133	.113	.132	.120	.131
Net Underwriting Profit(Loss)	.068	.086	.024	-.079	-.129	-.005

a) Expense ratio excludes all claims adjustment expenses.

b) Imputation based on Casualty Insurance statistics.

Source - Booth Table 12.

B. Rate Making

i) Competition and Rate Structures

At a conceptual level the premium charged for insurance coverage should reflect the insurance company's expectations concerning the losses to be incurred on the policy, the expenses both fixed and variable, and the investment income derived from the premium. In most cases, the expenses and investment income are independent of the identity or characteristics of the insured. However, losses need not be.

These expectations of losses are formed by observing previous experience and incorporating any indications of changes. Since the interpretation of events that may affect expectations can be unique to an insurance company, the expectations need not be homogeneous across insurance companies.

In the previous section it was observed that actual premiums had as an important ingredient the observed pure premiums, however, these were considered on an aggregate basis and any insurance premiums derived from these pure premiums would reflect the average risk and loss experience for the province.

In a competitive industry, pricing 'on the average' will not exist. For example, suppose there was only one company in the province which wrote insurance based on the average experience. The premium is \$500 per insured. Suppose entry is not blocked and another company decides to enter the industry. Based on historical data for loss ratios and on common sense, the company believes that farmers are less risky as a group than the provincial average. In fact, at a premium of \$300 the company could write policies to farmers and earn at least a normal return for the risk it accepts.

The company, when it offers coverage at \$300, will attract a large number of potential insureds. By using a pre-determined set of criteria, the company sorts insureds into those of the risk class that it is willing to accept and all others. The remaining insureds will stay with the original company at the \$500 premium. However, the remaining insureds are now riskier than the previous average since the low risk group has been removed. The company

will have to raise its premium or it will lose money. This process of sub-dividing the original market into equivalent risk class sub-markets will continue until the incremental cost of sorting individuals into a new class exceed the benefits (profits) of writing insurance in the new class. In equilibrium, insurance premiums will reflect the expected pure premiums for each risk class along with the expense and investment income ratios.

A good example of this process occurring in the Ontario insurance market can be observed in the writing of taxi insurance in Toronto. Due to the very high loss ratios (approximately 2.0) and the large number of BIPD claims, taxicabs have been insured by the Facility Association at a premium of \$7,500. One company, the Co-operators General Insurance Company of Guelph, believed that it should assist the taxicab co-operatives. By setting premiums below the Facility premium they obtained about 40% of the market. This exposure to the Toronto taxi market is greater than the company expected or wanted. In fact the company is now in the process of determining whether the taxi co-operatives receiving insurance are truly co-ops.

It is crucial to this process that the insurance company be able to sort risks effectively; the data used must be reliable, verifiable and not under the control of the insured. Thus information such as asking how fast an individual drives is not very useful since the insured, in order to minimize the premium, may lie. The information obtained should act as a signal of the driver's risk; it should be a signal that cannot be altered to provide incorrect information about the insured's risk.

The result of this search for risk classes is a complex structure for risk rating. It includes a number of variables such as age, sex, number of years of claim-free driving, etc. In addition, brokers and agents have some influence on the risk rating of the individual using data that may be unique to them. Of course, with this decision-making ability comes responsibility; to the extent that the brokers rate insureds incorrectly, the companies that they represent may not continue using them.

This system of risk rating, while it is costly, has a significant number of benefits. First, the insured pays a premium which covers the expected costs imposed on the company and on society. This provides incentives to insureds to alter their driving behaviour in order to place them in a lower risk group and hence a lower premium. For the very risky drivers, the premium level may actually keep them off the roads; these individuals are faced with insurance premiums that are in excess of the value they derive from driving. Included in this high risk group will be teenage male drivers whose loss experience is the highest of all groups.

Another beneficial aspect is the incentive to private insurers to innovate and find new methods of classifying individuals more effectively or of finding new rating classifications. The lure of profits, by being the first company to identify risks more effectively, ensures that an unregulated, private insurance industry will continue to innovate.

ii) Rating Structures and Risk Categories

Having identified the response of a competitive industry in which there are no barriers to entry with respect to risk rating and premium setting, we now consider whether the signals chosen do discriminate among risk classes and should premium levels differ by risk group. Instead of looking directly at the insurance premium charged, and there will not be a single rate for each category for all companies, we consider the size of the pure premiums based on widely used classification schemes.

The pure premiums for various risk groups, as identified by a set of signals, are well documented in the Booth research; his conclusion is that the levels of pure premiums do indeed differ by risk class and that the classification scheme appears to discriminate among risks.

For example, looking only at Ontario, one would expect that a simple signal is whether or not the insured drives in Toronto. Using 1986 loss cost data, the Ontario-wide pure premium was \$442.06; the Toronto value was \$560.04 and included 31% of insureds; the Kenora value was \$293.02 and the value for the farmers' category was \$253.36.

Therefore, premiums should be different for these categories since they impose different expected costs on the insurance industry.

Essential to the risk classification is the existence of sufficient numbers of observations in each category to make pure premium numbers reliable. The categories presented for Ontario are not fine enough to permit premium setting, yet any finer gradations will not provide enough observations. To get around this problem, Canada-wide data are analyzed and broken down into finer risk classes.

In Figure 3 below one particular breakdown is presented along with the number of insureds and the pure premiums. The observations are, in general, consistent with differential premiums based on risk-based pure premiums. The risk classes chosen are intended only to illustrate the concept.

Clearly the urban/rural split is crucial in defining a risk class since the pure premiums are much higher for the urban insureds. Another signalling device is the number of years of claims-free driving. Looking at two extremes it is observed that the pure premium for five years of claim-free driving is much lower than the value for no years. Notice that the numbers in the latter category are much smaller -- 52,736 versus 2.7 million in the claims-free 5 year category.

Age and sex are also variables used to discriminate or signal among drivers. If we consider young drivers with no claims free experience, we observe that the pure premium for males under 20, whether single or married, is over \$2,000! The value for females under 20 is \$761; the use of sex seems to be an important distinguishing risk feature for young drivers.

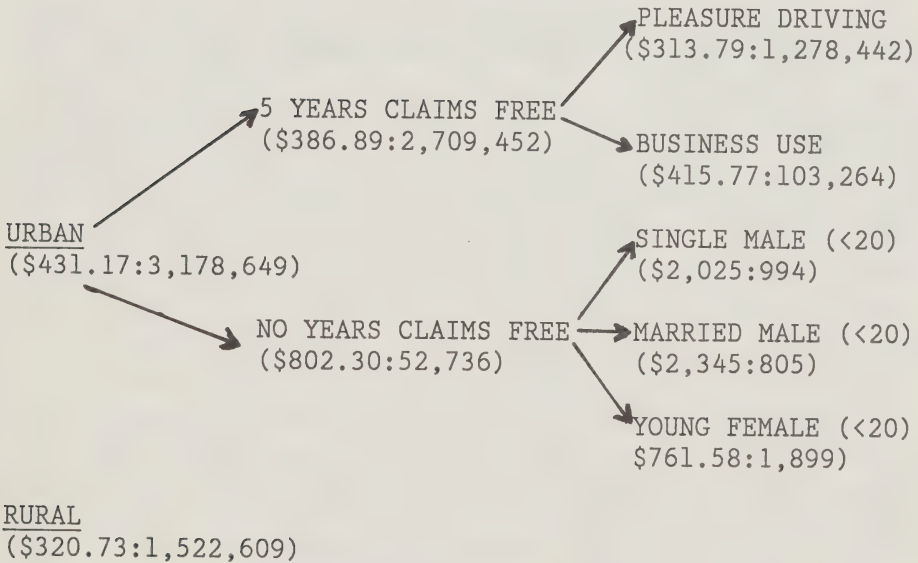
The sample sizes for these three categories are quite small and the claims experience in any one year could be affected by a small number of large claims. Therefore, experience over a number of years would assist in distinguishing the random elements from the true underlying value of the pure premium. The observations for young drivers is robust over a number of years. The conclusion is obvious; young male drivers are risky, have high claims

experience and should pay insurance premiums that reflect the expected costs they impose on the system.

To obtain some corroborating evidence on the pure premiums by risk class, the U.S. experience was also evaluated. The results are consistent with the Canadian observations with respect to all the important rating signals used to allocate drivers to various risk classes.

FIGURE 3

CANADA
(372.70:8,076,134)



Therefore, the Ontario automobile insurance industry pricing practices are consistent with a competitive industry. The search for profits leads firms to innovate and attempt to identify risks more accurately. The necessity to test potential new classification schemes against observed loss experience can result in a gradual introduction of some innovative techniques.

iii) Rate Making and Fairness

It has been suggested that the risk rating practised by private firms is unfair since it puts individuals into a risk category and individuals within this group may not be all of the same risk. Of course, if there are discernable sub-groups in a rating category, a competitive automobile insurance industry will try to identify them provided the costs of so doing are not too large. As the criticism goes, a 'fair' position would have fewer distinctions in rating and more cross-subsidization. The ultimate impact is that insureds would not be charged based on their expected cost to the system.

We do not want to become involved in a discussion of fairness; instead we will look at the implications of a system which does less risk rating.

An example of the movement to a 'fair' rating system is the setting of premiums for teenage drivers with no driving experience. The B.C. public insurance company originally risk rated young drivers and charged premiums based on the expected loss costs of the group. However, it was decided that this method assumed that all new teenage drivers were equally risky and this was not true. The solution was to charge all new teenage drivers the same premium but one which does not cover the expected losses for the group. As the teenager obtains a driving record, surcharges for claims experience, etc. will be charged. Thus the teenager eventually is rated properly.

Since the new teen driver does not pay premiums to cover his or her group's loss costs and given that the losses will be incurred, on average, then all other insureds are subsidizing new teenage drivers. Since the number of new teenage drivers is small, the cost of the subsidy to each lower risk driver when spread over all other drivers is very small.

Could this type of rating structure exist in a private automobile insurance industry? As long as pricing is unconstrained, the private company must base its premiums on expected losses and would be unable to cross-subsidize. As long as entry is possible, a cross-subsidy cannot continue. The only way a cross-subsidized rate structure could continue would be to have strong regulation which

defines acceptable risk classes and the associated premiums.

The implications on accident rates has already been discussed in the context of setting a premium which does not reflect the cost imposed on the system. In the teenage automobile insurance example the result is there are more teenage drivers and given their proclivity for accidents, more accidents and deaths. By having premiums reflect the expected loss costs, many teenagers could not afford to drive and hence accidents would decrease.

In addition there is a wealth redistribution from the less risky drivers to the risky new teenage drivers. It is true that this amount is small per non-teen insured but the dollar amount may be sufficient to force a low risk individual to cease driving because of financial reasons.

IV. EFFICIENCY COMPARISON: PRIVATE VS. PUBLIC DELIVERY

In the debate on public versus private ownership of the automobile insurance industry, each side has generated 'empirical' evidence on the relative efficiency of each system. In many cases, this empirical evidence is mixed with philosophical or political influences. In this section the performance of the Ontario private system is compared with that of the three provincial systems.

In these comparisons, we omitted consideration of the Province of Quebec. Since the Quebec system includes no-fault as well as public ownership aspects, therefore if efficiency differences were observed, it would be impossible to relate them exclusively to the public delivery element; the no-fault aspects of the system may be the true reason for the observed differences.

Empirical analyses in this area usually take the form of comparing premiums for a particular policy in Ontario and in the public systems. If it is found that the public system can provide the same policy to the same individual cheaper than the private system, the conclusion is that the public system is more efficient.

Comparisons like this are frequently misleading and at best are illustrative. It is only when all factors are held constant that any premium comparison will make any

sense. It is the conclusion in the Booth study that it is difficult to keep the other factors constant.

In this section we present the results of the Booth study. It is concluded that although it appears that the public systems have lower expense ratios, this is not due to economies of scale but to a decision not to engage in the costly process of risk rating to any great degree. The resulting cross-subsidies can explain a number of the observations where high risk drivers have lower premiums in public than in private systems. Ignoring the possibility of subsidies in the public system, the introduction of a public system which has no risk rating and substantial cross-subsidies of risky drivers by less risky drivers will reduce the overall premium level by about 6.5%. However, for a number of reasons, this estimate is very likely to be too high and it is possible that premiums will increase.

1. Caveats re Comparisons

Before undertaking any of the analysis, the limitations in the comparisons of public and private systems must be understood. At this point, the problems will just be identified; their impact, if any, will be investigated in more detail in a subsequent section.

First, there are problems in obtaining data for the public systems; the data are sketchy and are usually found in the annual reports. Second, the public companies operate under a different set of constraints. Even the public companies operate differently amongst themselves, with the B.C. insurance company having operations closest to a private company. Third, the public systems do not pay corporate tax and in one case (B.C.) did not pay premium taxes. Fourth, many of the inputs of the public system are acquired from the government at less than competitive rates. Finally, the basic coverages of the public and private systems insurance policies are different.

All of these differences can have an important impact on the interpretation of the results identifying the relative efficiency of public and private systems.

2. Performance of Public Plans: Elements of Premium Setting

2.1. Regional Differences and Premiums

In a previous section we identified a major element in the premium to be the expected loss costs per vehicle. When considering the Ontario results we observed differential loss costs among the regions of the province. Rural loss costs were less than urban, and Toronto seemed to have the highest costs. This regional element in premiums should carry over to the comparison of public and private systems.

Realizing that the public system numbers reflect total vehicles insured, not passenger vehicles as in Ontario, and have different coverages, the loss cost statistics do provide some interesting observations. First, the loss costs for Ontario farmers and the total of Saskatchewan are very close -- 1985 values were \$241 for Ontario and \$228 for Saskatchewan. Even though the Saskatchewan results include some urban areas, overall its coverage would be most similar to the Ontario farmer classification.

The overall Ontario loss costs (which exclude farmers) for 1986 and 1985 are higher than all provincial systems. However, comparing Ontario and British Columbia we observe that over the period 1983 to 1986 Ontario loss costs were about 5% higher than those in British Columbia.

The loss cost data suggest that the primary cost for car insurance rates within a province can be explained by the pattern of regional variation reflected in urban/rural and farmer/non-farmer mixes. To the extent that provinces differ in this dimension, the average loss costs will differ.

Using the loss costs and the observed loss ratios by province, a schedule of provincial average premiums was constructed. It should come as no surprise, nor should any non-competitive or relative efficiency conclusions be made from the observation, that over the period 1982 to 1985, the average premium for Ontario at \$389.16 exceeded those for British Columbia (\$361.70), Manitoba (\$274.76) and Saskatchewan (\$228.63).

2.2. Claims Ratios

The claims ratio provides an indication of the dollars paid out, including claims adjustment costs, per dollar of premium. Since the private system premium must include an allowance for income tax, the private system's ratios will tend to be smaller than public system ratios even if they had identical claims experience.

From Table 4, it is observed that for the period 1982-5, Ontario had the lowest claims ratio and the primarily automobile insurance writers average claims ratio was even lower to reflect the fact that they write in provinces other than Ontario which has had the greatest increase in claims costs. The pattern remains the same for those systems which have data available for 1986.

TABLE 4

Average Claims Ratio

<u>Time Period</u>	<u>Sask.</u>	<u>Man.</u>	<u>B.C.</u>	<u>Ont.</u>	<u>Primarily* Auto Writers</u>
1982-1985	.959	.959	.998	.901	.801
1982-1986	N/A	.995	1.013	N/A	.833

*Five companies which wrote more than 70% of their total insurance in the automobile line.

2.3 Expense Ratios

The second element in setting premiums reflects the expenses incurred in the areas of processing claims, administration of the system and commissions to agents. Since there are no economies of scale involved in the writing of automobile insurance, differences in the expenses per dollar of premium will not be a result of size of the public compared to individual private firms. Therefore, if lower expense ratios are observed in the public plans, their explanation lies in some other area than size. In Table 5 the expense ratios for the three public insurance companies are presented for the period

1982 to 1986 and for 1985. In 1985 the Ontario companies were the subject of an expense allocation program of the IBC.

TABLE 5

	<u>Expense Ratio</u>		Excluding	
	<u>1982-86</u> <u>(Average)</u>	<u>1985</u>	<u>Premium Taxes</u> <u>1985</u>	<u>1986</u>
British Columbia				
Claims Adjusting	9.1	8.7		
Administration	8.3	9.8		
Commissions	<u>6.6</u>	<u>6.8</u>		
Total	<u>24.0</u>	<u>23.3</u>	<u>23.3</u>	<u>24.6</u>
Manitoba				
Claims Adjusting	10.7	10.8		
Administration	4.3	3.6		
Commissions	4.7	4.7		
Premium Taxes	<u>3.0</u>	<u>3.0</u>		
Total	<u>22.7</u>	<u>22.1</u>	<u>19.1</u>	<u>20.8</u>
Saskatchewan				
Claims Adjusting	8.5	8.5		
Administration	8.2	9.8		
Commissions	.9	1.2		
Premium Taxes	<u>3.7</u>	<u>4.0</u>		
Total	<u>21.3</u>	<u>23.5</u>	<u>19.5</u>	<u>17.0</u>
Ontario				
Claims Adjusting	N/A	11.2		
Administration	N/A	9.4*		
Commissions	<u>N/A</u>	<u>11.5</u>		
Total		<u>32.1</u>	<u>32.1</u>	<u>N/A</u>

*Excludes premium taxes.

In interpreting these results, there are a number of caveats to keep in mind. First, for Saskatchewan, Manitoba and for British Columbia up to 1984, the public plans were involved in writing in a number of lines. Thus common costs must be allocated arbitrarily. This can lead to unreliable results. For example, in the Saskatchewan results, the administration expense ratio dropped by 4.7 percentage points from 1982 to 1983 and the opposite movement occurred in this element of the expense ratio in their general insurance operations. Second, we will see in the next section that over the period in question the premiums charged in Saskatchewan were too high. Thus any ratios which use these premiums in the denominator will be too low. Third, it has been suggested that there are a number of expenses that are covered by private firms which public firms do not meet. These include the payment of competitive rates for the provision of government services and use of facilities. In addition, these plans do not appear to pay the \$5 fee levied on Ontario firms for accessing provincial driving records. These missing elements are impossible to cost. Whether or not this is a subsidy to the public plans will be considered in section IV-3 below.

Several observations are made from the results of Table 5 with respect to each element of the overall expense ratio:

i) Claims Adjusting

For the public plans, this ratio ranges from 10.7% to 8.5%. As noted previously, the value for Saskatchewan is likely to be too low. The Ontario value of 11.2% is slightly above the values in the public plans; the difference is reduced somewhat by removing the 1.3% overhead allocation included in the Ontario value. Moreover, there appear to be no significant differences in the claims adjusting ratios among the public and private plans.

ii) Administration

The Ontario value of 9.4% is higher than the public plan 1985 values of 7.8% for B.C.; 3.6% for Manitoba and 9.8% for Saskatchewan. The Saskatchewan result is not directly comparable since it includes the costs for administering the driver and vehicle licensing system.

The result is that the Ontario private system has higher administration expenses than the public plan.

iii) Commissions

The 1985 value of 11.5% for Ontario is well above the values for the public plans of 6.8% for B.C., 4.7% for Manitoba and 1.2% for Saskatchewan. However, there are large differences in this ratio among the public plans. The explanation of these differences may also identify why the Ontario results are so high.

iv) Premium Taxes, Licences and Fees

The public plans and the Ontario companies must meet different levels of premium taxes; these range from a high of 4.0% for Saskatchewan to a low of 0% for B.C. The Ontario value is 3.4%. Since they are mandatory, they should be excluded from any discussion of the overall expense ratio.

v) Overall Expense Ratios

After removing the premium taxes, the values for 1985 shown in Table 5 are 19.1 for Manitoba, 19.5 for Saskatchewan, 23.3 for B.C. and 32.1 for Ontario insurers. The major difference arises from the commissions ratios and a minor amount from administration expenses.

One possible explanation for these differences is that the public plans have indeed found a way to operate more efficiently. If this is true, then the expense ratios on their other insurance lines should also be low and in fact lower than ratios for private companies involved in multiple line writing. Booth considered this issue directly by investigating their expense performance in the general insurance areas and found two striking observations. First, expense ratios in total and in the administration and commissions area were much higher than the automobile results. Second, the expense ratios compared unfavourably to the non-auto expense ratios for private companies. Therefore, we must look to another explanation for the lower automobile expense ratios for public compared to private plans.

The obvious saving is that public plans do not rely as heavily on the agency system as the private companies and hence minimize this set of transactions cost. However, in private delivery, the agency/broker system performs the costly task of screening applicants in order to allocate them to the appropriate risk class, provides information to potential customers about various coverages and costs, and shops the market for new companies to represent. The provincial systems clearly do not have the expenses of shopping the market or informing customers of competing companies' rates. But just as important, the provincial systems do not have as complex a risk rating scheme and the associated cost to screen clients is not incurred. The rudimentary risk rating of some of the provincial systems generates premiums which result in significant cross-subsidy of risky by less risky drivers.

The Manitoba and Saskatchewan systems have a simple and mechanistic method of charging insureds for different risks. The system may be cheap but it results in significant cross-subsidies. The B.C. system has a more complicated rating scheme and relies on some of the variables of a system used by private companies. Although still maintaining some cross-subsidies, they are not as severe as in the other public systems. However, with the more complicated rating system come higher transactions costs. This explains why the B.C. commissions and administration expense ratios are closer to the values found in the private system.

Therefore, the higher expense ratios for the private compared to the public system indicate neither inefficiency in the private system nor the presence of economies of scale. The higher private companies' expense ratios reflect the competitive response to refine the rate structure so as to price the risk of the insured correctly. This results in an efficient use of resources devoted to insurance. In effect, the public system obtains cost reductions by limiting choice, enforcing cross-subsidization and ignoring the deterrence effect of premium rates on accidents either through reducing the number of high risk drivers or altering their driving behaviour so as to obtain lower premiums.

2.4 Underwriting Performance

Having observed the claims and expense ratios, we now consider whether the provincial plans set the premiums such that there is an imputed return on the 'free' liabilities generated from writing policies and whether the underwriting profits after adjustment for investment income are zero. If the profits are consistently negative, there is a suggestion of subsidy by the province; if they are consistently positive, the insureds are overpaying for insurance. Neither of these situations could persist in a private system with competition and free entry.

To determine net underwriting profit, the free liabilities per dollar of premium earned generated by selling policies must be identified. The approach used is conceptually valid but the estimates of the necessary variables in the calculations would need more refinement if they were to be used in any regulatory function.

Some interesting results were found in this analysis. First, the public systems operate with very little in the way of reserves or equity. Since the province stands ready to make up any losses due to unforeseen circumstances, the equity cushion is not needed. The corollary of this observation is that most of the investment in insurance assets is financed with premiums and therefore the free liability ratio is high. For example, for ICBC the average value for the free liability ratio over the period 1982 to 1986 was 96.2, compared to a value of 72.5 for the Canadian companies proxy for automobile insurance for the period 1981 to 1985. Whether the absence of equity is a subsidy to public systems will be evaluated in a subsequent section.

Second, the assets allocated to the insurance function are a small proportion of total assets for a typical automobile insurance company; for example, in British Columbia the value has fallen steadily from 14% in 1982 to 7.1% in 1986; this compares to a value of about 22% for Canadian private companies.

Third, there is a disparity in the liabilities per dollar of premium earned. For all private insurance companies, the average value for 1981-85 was 1.084; for Canadian casualty insurance companies the value over the same period was 1.01. For Manitoba the average over 1982 to

1986 was .904 with the 1986 value of 1.14; the value for Saskatchewan was .883 over 1982-5. While the value of liability per premium dollar earned was broadly equal for Manitoba, Saskatchewan and Ontario, the value for B.C. is very high. Its low value in the sample period was 1.15 in 1982 and it rose to a value of 1.96 in 1986. The average value is 1.55. One explanation of this high ratio is slow payment procedures which generate a large amount of unpaid claims. Notice that with the large free liability per dollar of premium there is a substantial element of investment income to reduce premiums. Thus a comparison of premiums without taking this factor into consideration can give meaningless results.

Finally, the underwriting profitability was evaluated for the public systems. Remember that in the Ontario private sector analysis it was found that on average the industry had lost .6 cents per dollar of premium. The analysis shows that the Manitoba system lost 1 cent per dollar of premium over the period 1982 to 1986 and the B.C. system earned 1.7 cents per dollar over the same period. These observations suggest that the systems have set premiums to cover costs and the imputed return on insureds' investment. Therefore, no operating subsidy is observed in either system.

The Saskatchewan results show a profit over the period 1982 to 1985 of 12 cents per dollar; the profits ranged from 10 cents in 1982 to 22 cents in 1984. The 1985 value was a loss of 3 cents. The Saskatchewan system had a deficit and a loan from the province which it attempted to pay off by charging high rates. This is an approach that is not available to a competitive firm.

Therefore, both the Manitoba and British Columbia systems priced their policies accurately whereas Saskatchewan overpriced their policies to build up a reserve and make up for the lack of profits in the past. Therefore, the public systems did not appear to consistently underprice their automobile insurance.

3. Subsidies in Public Systems

A subsidy occurs when a cost that is incurred by the public insurance company is either not paid or not paid in full but is passed on to another party. In the public automobile insurance area, the third party would be the

taxpayers of the province. If the public systems do have subsidized components within their operations then premium comparisons are not valid. For example, if certain expenses are not paid by public systems then the expense ratios are low and the premium is relatively low. To have valid comparisons between public and private systems would require an adjustment to the public sector premiums to reflect the subsidies. Unfortunately, the subsidies may exist but are not amenable to measurement and the necessary adjustments cannot be made.

In this section we investigate the suggested sources of subsidies and, where possible, evaluate their impact. The subsidies considered are the absence of a return on the equity investment that is included as a cushion, absence of an allowance for corporate income tax, and the use of services provided by the government below cost.

i) Equity Capital

It has been suggested that the absence of equity or reserves is a subsidy since the public sector plans must invest equity as a cushion and there should be a return on this equity either through dividends or by reinvestment of earnings. Therefore, it is argued that equity should be imputed in public systems and premiums should increase in order to provide a rate of return on this investment. In general, this argument does not appear to be valid. From the model it was observed that equity capital which was used as a cushion was independent of the underwriting side of the operation. The equity is invested in a securities portfolio and the returns are based on this investment portfolio. If the public system were forced to place equity in the operation, the premium rates would not be affected since the equity would be invested in a securities portfolio. The fact that the government does not invest in the company means that it is earning returns on other investments.

This argument would have to be modified somewhat if in the private companies, the equity was used to finance insurance assets as well as act as a cushion. In this case the portion of the equity invested in the insurance assets does not obtain a return from the investment portfolio. Thus, the return must be earned from the insurance operations and this will occur only if the premiums are increased. Therefore, a public system by not using equity

would be subsidized to the extent of the return earned on the equity invested in the insurance operations. The analysis in the Booth study suggests that equity capital in the private companies is not used to finance insurance assets and hence it is unlikely that there is a subsidy. The approach in the Booth analysis used aggregate balance sheet data; a further analysis using individual firm data is necessary to refine the estimates.

There are, however, instances where a subsidy can be provided by the provincial government. For example, if the government continually must inject equity to cover losses of the provincial system, then premiums are too low and there is a subsidy. Also, if the government invests equity into the public system and it is regularly destroyed through losses due to underpricing of premiums, thereby forcing further injections of capital, there is a subsidy present.

ii) Corporate Income Tax

Private systems must pay a corporate income tax on income earned; premiums in the private system must cover this income tax expense. In the public system, there are no income taxes to be paid and hence premiums are lower. This represents a subsidy since the taxpayers of the province receive benefits from the federal government; these benefits are financed by the corporate income tax. If this tax is not collected then the taxpayers in the province will have to finance the services through higher provincial taxes. Therefore, ignoring the corporate tax element is a subsidy to public insurance companies and result in non-comparability of premiums.

iii) Input Prices

It has been suggested that some of the public plans do not pay competitive rates for services from the provincial civil service. It is also possible that these systems obtain the use of buildings at less than competitive rates. This clearly cannot be the case for private insurance companies.

If these suggestions are true, then there is an obvious subsidy equal to the difference between the competitive and actual rate charged. The cost of this

subsidy is borne by the taxpayer who must pay for the unrecovered cost of the services provided.

4. Premium Comparisons: A Meaningless Exercise

It was noted previously that premium comparisons between cities under public and private systems can be at best illustrative and at worst meaningless. These comparisons are difficult for a number of reasons. First, the attributes of the insured must be held constant. These attributes include age, etc. and comparability of loss costs in the region. For example, loss costs in Vancouver are not the same as in Toronto! Second, there are subsidies to public systems which are not available to private companies. This will reduce premium levels for public systems. Third, even if the first two issues are not important, the presence of cross-subsidies in the public systems make comparisons of premiums meaningless.

For example, the premium comparisons used in the Toronto Star are evaluated in the Booth report. Using a 22 year old male with six years of claim-free driving, the average premium in Toronto is \$1,327; the premium in Vancouver is \$529. The difference in average rates of \$793 reflects the cross-subsidy provided to risky drivers in B.C. In fact, looking at the 22 year old male with one accident, the average rate in Toronto is \$3,376 and in B.C., the value is \$413. The larger difference in premiums and the fact that the rate in Vancouver is lower for this class than for the less risky claim-free driver reflects the substantial cross-subsidization. Considering the lower risk categories, a 43 year old male with six years of claim-free driving has an average premium in Toronto that is \$70 greater than the premium in Vancouver. However, if the individual shopped around in Toronto, a rate \$31 cheaper than the rate in Vancouver could have been obtained. In addition, the rates quoted are not the result of negotiation but are standard rates. It is possible that the actual rate would be lower than the posted rate obtained in a telephone survey.

Since premiums cannot be compared, the reasonableness of the Toronto rates was evaluated by looking at the underlying claims costs. A premium was built up from the claims costs, expense ratios and investment income for the three classes of drivers considered in the premium comparison. The premiums are not directly comparable since they

are built on \$200,000 of third party liability and the Star quotations are for \$1 million. The result is that the premiums generated by the analysis are within the range of quotes obtained from private insurance companies and are slightly higher than the average quotes for the classes. However, the premiums are reasonable and based on current costs associated with the coverages.

5. Cost Efficiency of Moving to a Public Plan

Everyone is interested in paying lower premiums for their automobile insurance policy. Will the introduction of a public-run automobile insurance company result in lower premiums for all insureds? If not, will the increase in rates for some insureds be more than offset by the reduction in rates for other insureds? In this section this question is investigated. There are a number of changes that could be introduced that would result in lower premiums. These include the introduction of no-fault insurance with its reduction in legal costs; limitations on awards will reduce expected claims costs; and restrictions on the right to drive for high risk groups. This latter change could be implemented by raising the driving age and introducing automatic suspensions of driving privileges for repeat offenders. These features would reduce expected claims costs. While all of these changes would reduce insurance premiums, they are beyond the mandate for this research.

The alternative that is investigated here is the change from a private to a public system. From the analyses in previous sections of this report, it is clear that there are no economies of scale and hence any savings must come from simplification of the rate structure and the enforcement of mandatory cross-subsidization. In the public system there would be a simple rating scheme which provides a crude sorting of drivers into different risk classes. This would reduce administrative costs and some portion of brokerage fees since there would be no costs involved in sorting insureds by risk. In addition, the commission costs would be reduced since there would be no brokerage network and hence no cost of dealing with new customers.

In order to estimate the premium costs for private and public automobile insurance, the Booth report begins by building a composite Ontario premium. Using thirteen

rating categories, an estimated overall premium is calculated for each category. The Ontario premium is a weighted average of the premium for each class where the weights reflect the proportions insured in each category. In building the Ontario premiums the Canada-wide data on BIPD, collision, comprehensive and accident benefits were adjusted by the Ontario surcharge. The expense ratio used was 25% and the imputed investment income ratio, 12%. The weighted average premium for Ontario was \$561.30. The premiums used in this calculation are not those that are actually charged but are based on the pure premium calculation.

If a public system were established and it is assumed that the loss and investment income ratios are the same as in a private system, the only benefit would arise through a reduced expense ratio reflecting the savings through minimal risk rating. Using a 19% expense ratio, in line with the B.C. experience, the Ontario premium is \$526.09; this is a saving of \$36.21 or 6.5%.

The savings are not large enough to have everyone benefit from a reduction in rates. By charging the same rate to all drivers, the lowest risk class which has approximately 43% of the driving population would have an increase in premiums of about \$55 or 22.6%. For all other classes, premiums would fall. The second most populous class would have a 4% reduction in rates. This is so small that its value could be zero. The savings are greatest in the high risk categories which have a small number of drivers. For example, young drivers' rates fall by approximately \$1400! Therefore, the result is a substantial cross-subsidy where increases in premiums for approximately 43% of the drivers subsidize substantial premium reductions for the 20% who are above average in risk.

This analysis suggests that any savings from moving to public ownership are small (approximately 6.5%). However, this analysis is incomplete and primarily suggestive. As the implications of moving to a public system are integrated into the analysis, the costs of moving to a public system would be higher.

First, the premiums in the analysis were built up from 1980 loss costs and may not reflect actual premium levels. Second, there is always a spread in premiums set by dif-

ferent companies for the same risk class and this variation in premiums could encompass the premium for the public system. This is a result of the competitive process. Without this push, there is no incentive to keep premiums low in the public company. Thus, a company in Ontario could easily have a premium below that of the public system.

Third, the cross-subsidy element will result in more young and risky insureds being on the roads. This will reduce the average quality of drivers on the road, thereby increasing the overall claims costs. This will increase the average premium under the public system alternative and will require even more severe cross-subsidization.

Fourth, it is assumed that the claims costs incurred for collision remain unchanged. Without the competitive pressure to minimize costs, there will not be an incentive to lower the costs of providing insurance service. This is a problem common to Crown Corporations and industries that operate subject to a regulatory constraint.

Fifth, as already noted in the previous sections, the comparisons are troublesome since the lower expenses of the public systems include unmeasured subsidies such as non-competitive costs for space and the absence of corporate taxes.

In conclusion, the movement to a public system is unlikely to result in any cost savings. Any savings which could occur through lower expenses of providing insurance arise only through a reduction in the use of rating classifications and the resulting introduction of inefficient cross-subsidization.

6. Comparisons with Woods Gordon Study

In 1978 Woods Gordon prepared a study for the Select Committee on Company Law. Report IX considered the issue of Government Ownership of Automobile Insurance. In this study a number of alleged advantages of government ownership are presented. It is our conclusion that the benefits of government ownership as proposed by the Woods Gordon Study are illusory and do not stand up to close scrutiny.

In Appendix C of the Booth Study, there is a review of the arguments presented in favour of government ownership and the response to these arguments that arises from the analysis in the current study.

Since the Woods Gordon Study was the only other major piece of research on the public versus private delivery of automobile insurance issue, the contents of Appendix C are reproduced here.

APPENDIX C: ARGUMENTS FOR AND AGAINST PUBLIC OWNERSHIPFORAGAINSTPremiums

Reduced premiums due to investment income and operating efficiencies (see below).

Lower premiums are an illusion clouded by hidden revenues (such as gas tax) and subsidies (see below). Investment income also directly lowers private insurance premiums and potential efficiencies are negated by unions and the waste inherent in the public sector.

Efficiency

Improved efficiency in terms of the fraction of premiums returned as claims as a result of:

- non-adversarial system saves on legal and negotiating costs
- restructured claims and settlement procedures which streamline claims and simplify systems for paying repair shops
- reduced delivery costs
- economies of scale

The use of Intercompany Settlement Charts by private insurers already restricts the use of courts for collision cases to those in which doubt exists as to fault. Gradual decrease in efficiency due to union labor costs, poor incentive structure and the absence of a bottom line. Increased visibility and public scrutiny create the need for more documentation and internal checks and balances for decisions.

Fairness

More equitable and fair compensation system

Oversimplification of rating system is unfair.

because it avoids unpredictable courts. Rates are set based on individual driving records so that unfair age and sex discrimination is avoided.

Unfair to safe drivers because poor drivers would be subsidized too much and incentives lessened. Tendency to oversimplify adjusting decisions by arbitrarily assessing equal fault in order to streamline operations.

Hidden Subsidies

ICBC subsidizes other government departments through:

- discounts to seniors and disabled
- hospital plan contributions
- free use of ICBC computers

Public plans are subsidized by:

- paying no premium or corporate taxes
- free access to police records
- maintaining no loss reserves

Availability and Affordability

No residual market

Residual market is adequately served by the Facility Association. Availability of other types of insurance may suffer if some private insurers leave.

Ability to provide affordable insurance to high-risk drivers through subsidization.

High-risk drivers are already subsidized. Further subsidies would lessen incentives and be unfair to safe drivers.

Investment Income

Investment income is utilized in Ontario, rather than being a drain on available capital.

Integrated world capital markets are readily accessible from Ontario so this factor would have no effect on either the availability or cost of capital. Also, 1982 figures show that ICBC has 82% of its funds in government of Canada bonds and bank deposits and only 18% in BC and municipal bonds.

Quality of Service

Public convenience due to:

- one stop shopping and claims adjusting
- less hassle in settling claims
- direct dealings with insurance companies.

Poorer service because there is no threat of losing a customer and public employees lack motivation. Studies of public perception also support this view of public companies.

Profits

Profits are used to increase benefits, reduce premiums and absorb losses, rather than being distributed as dividends. Taxes not paid to Federal government.

Loss of corporate taxes must be made up by increasing other taxes.

Note: Ontario could ask for profit remission for private companies similar to private provincial power companies.

Social Benefits

Better organization of driver education and research programs due to centralized information and resources.

In-province head office prevents cash flows to out-of-province head office.

Greater commitment and responsiveness to social needs.

Existing education programs have been effective.

Most Canadian firms have head offices in Toronto and foreign firms also have large offices here.

Potential for use as a political vehicle, violating sound business and insurance practices. Need for mechanisms to control monopoly prices and practices.

Impact on Repair Industry and Costs

Lower repair costs due to monopoly power over repair shops and more research into new repair methods.

Private insurers presently get discounts from shops for promising volume, a practice which would be inappropriate for a public company. May disrupt healthy competitiveness between repair shops by introducing significant economies of scale, to a unionized oligopoly.

Start-Up Difficulties

Early difficulties are common to all businesses and are worth it for the long-term savings.

Logistical problems associated with starting such a large company from scratch.

Confusion during change-over due to staggered policy renewals.

Tendency towards higher claims frequency during early stages as people take advantage of what they see as a bottomless public purse.

Philosophical Issues

Insurance premiums should be:

- based on individual records
- affordable for all
- available for all
- provide adequate compensation to all injured parties regardless of fault
- not force drivers to contribute to private sector profits.

The free market is the cornerstone of a free society. In claims settlement public insurance companies represent the interests of society as a whole, rather than individual customers. Public ownership is not a solution to problems with the products. Public opinion currently favours less government involvement.

V. THE APPROPRIATE REGULATORY RESPONSE

1. Introduction

In previous sections it was noted that the form of the regulatory response by the provincial government should reflect the severity of the market failure. Since the analysis has been unable to identify any significant market failures, the obvious regulatory response is the minimum available; this would permit existing solvency requirements but no premium setting or review powers.

However, the provincial government has moved to freeze some insurance rates, roll back others and introduce a rate review process. In this section, the work of Professor Quirin, among others, will be reviewed to identify the regulatory responses available and to evaluate their impact on the competitive structure of the industry. Quirin, with others, concludes that since the automobile insurance industry is competitive, any regulatory procedures applied should not stand in the way of competitive pressures. Hence, regulation that regulates least, regulates best.

2. Regulatory Methods

The Quirin report presents an historical perspective to insurance regulation and then identifies a number of the areas in which controls are applied to the insurance industry. These controls or regulations range from minimum standards on entry, through reporting of financial and claims experience, and licensing and regulation of agents. The regulation that is of interest in this study is rate regulation. Most of the U.S. states have some form of rate regulation and in Canada, ignoring the provincially-owned systems, Nova Scotia, Alberta and Newfoundland also are engaged in rate regulation.

Quirin identifies three forms of insurance premium regulation. They are listed in decreasing order of control over premium setting:

- i) Prior approval.
- ii) File-and-use.
- iii) Market competition.

i) Prior Approval

The prior approval model requires the insurance company (or a set of companies through a rating bureau) to file proposed rates to the regulatory body. The rates are quoted for standard policies and evidence on proposed loss experience, expenses and underwriting profits is presented to the regulator at a hearing; evidence of intervenors who oppose the proposed rates is also heard at the hearing. The output of the process is a set of rates that is acceptable to the regulator.

There are a number of problems with the prior approval format. First, the process can be very time-consuming. This delay can be very expensive for the applicant. Second, there are significant costs to this process. The obvious costs include significant expenses undertaken by the insurance companies to prepare evidence and be present at the hearing along with the required cadre of lawyers and experts. Similar expenditures are required for the regulatory body. There are indirect costs that are very substantial. A regulatory scheme which permits prices to be set on a cost plus basis generates a number of disincentives to efficient operations. Since costs will be covered there is no incentive to operate to minimize these costs or to introduce new technology. To the extent that a firm becomes more efficient, if its rates are reduced to reflect the added efficiency, then there is no incentive to reduce costs.

Second, there are a number of variables that are needed in the regulatory process that are either very hard to measure or are the result of an arbitrary allocation procedure. For example, expenses for automobile insurance are allocated in an arbitrary manner; there is no correct answer but without competitive pressures, companies will try to allocate a larger proportion of the expenses to the regulated operations thereby moving profits to the unregulated lines. Also, underwriting profits are difficult to measure. Most regulatory bodies use a rule of thumb approach which provides for underwriting profits yet in the model developed underwriting losses are expected. In fact, the companies rarely earn underwriting profits even though permitted. This is probably due to market forces that are not included in the regulatory process.

Finally, there is a strong disincentive to propose rates which are different than the standard rate. These 'deviated' rates are based on expense ratios which differ from the industry value, differential claims experience and non-standard policy coverages. Deviated rates are a method in which competition enters and the denial of these rates entrenches inefficient operations.

ii) File-and-Use

This approach is a more leisurely approach to regulation of rates; it does not introduce significant time delays and is consistent with competitive forces. The insurance companies file rates and evidence on losses, expenses and underwriting profits and can introduce the proposed rates either immediately or after a short waiting period. The regulatory body then evaluates the case for the new rates and their finding may be that the rate is excessive. This results in a reduction of the rate and/or rebates of the excessive amount. This is, however, a rare event since the firm and the regulator typically use the same fundamental model to develop rates.

One important feature of the file-and-use system is that it permits deviated rates; companies which introduce these deviated rates must be prepared to provide evidence to support them. The spread of file-and-use rates in the U.S. has been an important factor in the enhancement of competition in the industry. By the time that a file-and-use rate can be attacked by those who do not want a competitive rate, the rate will have been copied by so many competitors that a victory is irrelevant.

iii) Market Competition

Under market competition there is no formal approval of rates. The regulatory agency may monitor the rates to ensure that competition in the markets under its control is producing rates which approximate marginal cost. Although not necessary, rates, loss experience and financial reports can be filed with the regulator.

The underlying premise is that competitive forces provide the best regulator of prices; intervention through rate reviews is justified only if there is a failure in some market such that competition will not work. The states who have used this approach include, California,

Missouri, Idaho and Illinois. The latter state has now totally deregulated automobile insurance and does not intervene in any form.

3. Canadian Experience

Of the three provincial jurisdictions in Canada that regulate insurance premiums, we consider Alberta and Nova Scotia. We omit Ontario since it does not have the regulatory experience of the other two provinces. Each of the provincial agencies receive a large amount of statistical and financial data from the statistical agency of the industry and the rating bureau. They have used consultants periodically to assist in the interpretation of the data.

In Nova Scotia, regulation is performed by the Commission which has had experience in rate regulation of investor-owned utilities. The regulators, while having a good feel for the loss cost data within their jurisdiction, are unable to obtain reliable data on expenses at a provincial level. This is due not to the unwillingness of companies to provide the data, but the difficulty in identifying expenses of one small part of the overall Canada-wide, multiple-line operations. Therefore, the regulator ensures that rates proposed for Nova Scotia reflect loss experience in the province.

Alberta set up its insurance rate regulation board in 1976. While less formal than that found in Nova Scotia, the criteria applied and the results obtained are generally the same. Moreover, both provinces do not appear to have strong controls on profitability or premium levels. Although these jurisdictions require prior approval, the hearing procedures are not time consuming and certainly do not constrain insurance companies' activities in a meaningful way.

4. The Regulatory Model: Public Utility

In the prior approval approach, and to a lesser extent in the file-and-use approach, some mechanism must be used to identify whether automobile insurance rates are acceptable or not. When formulated in this way, the comparison to the public utility model of regulation is obvious and many of the regulatory schemes for automobile insurance do utilize a very similar approach. However, it is our contention that the public utility model is not suitable and

its use where it is not appropriate will generate a number of serious problems.

The public utility model is a method of identifying an acceptable set of rates for the products and/or services of the utility that cover the costs of the company including taxes and interest on debt used to finance a portion of the assets and permit the utility to earn a rate of return on the portion of the assets financed by equity. The return on equity is not guaranteed and its actual value will fluctuate as actual revenues and costs deviate from their expected values. This regulatory model is in essence 'cost plus' regulation.

Once the permitted overall revenue for the firm is determined, the individual prices are determined subject to the revenue constraint. Problems abound in this model; these include the allocation of joint costs, dealing with non-regulated products and estimation of the return on equity. However, the underlying rationale for the regulation is that the utility is a monopoly and the competitive process will not provide restrictions on earning excessive profits. The companies regulated under this procedure include pipelines, gas distribution, telecommunications and electric utilities.

Applying this model to the underwriting activities of Ontario automobile insurance companies would require individual rates to cover the expected values of expenses, claims or loss costs and an allowance for underwriting profits.

The ease with which the regulatory model can be formulated for automobile insurance masks the serious conceptual and implementation problems. Some of these have been noted in a previous discussion on this section.

The problems include the following:

- i) Allocation of costs among regulated and non-regulated lines of insurance is difficult. The firm will attempt to increase expenses in the regulated lines thereby shifting profits to the unregulated lines.

- ii) Companies operating across Canada will have to allocate, arbitrarily, their costs to the Ontario operations.
- iii) The estimation of a profit for underwriting activities is difficult and conceptually should be a loss! The assets used for the insurance activities are funded by prepayments of premiums. If the assets could be allocated to automobile insurance, since they are not funded by equityholders, no return to equity should be provided. Further, the prepayments generate an investment fund, the earnings on which reduce the premium levels. Thus, the underwriting profits are expected to be negative, not positive. The degree to which they are negative depends upon the investible funds per dollar of premiums written. This will differ for each insurance company. Using average values will result in non-differentiated rates.
- iv) The automobile insurance industry is competitive and regulation is not necessary to correct for market failure. Introducing regulation where it does not belong will do one of two things; either it will force firms to leave the industry if the regulation is effective or the regulatory process may be captured by the company and rates will be higher not lower. Therefore, the problems of applying an inappropriate model will generate a regulatory regime for automobile insurance that does not promote efficiency or innovation.

5. Conclusions

In the U.S., the studies of insurance regulation are strong in their condemnation of prior approval regulation. For example, Jaskow (1973) concludes:

- (1) "Prior approval rate regulation should be eliminated and replaced with a no-filing system allowing insurance rates to be determined competitively ...

- (8) "Attempts by some states to go toward more price regulation rather than less should be vigorously discouraged ...

"There are very few examples of deregulation in the history of regulation in the United States. Here is an example, however, of a situation in which regulation has worked to the benefit of almost no one (except perhaps the direct writers) in the last fifteen years ... Those states which have eliminated formal rate regulation should be congratulated and other states encouraged to follow their examples."

In a study in 1977, Paul MacAvoy concluded:

"The evidence strongly suggests that unrestricted price competition is superior to rigid rate regulation as a way of achieving reasonable prices, a reliable insurance mechanism and economically fair prices which are based on an accurate assessment of the risk presented."

Other studies also found that premium rates and/or profits were higher in states with regulation. A more recent study by the U.S. General Accounting Office concludes just the opposite. However, Quirin identifies a number of serious problems with this study. One major problem is that there are more individuals insured under assigned risk plans in regulated than in non-regulated jurisdictions. Since the system as a whole loses money on assigned risk insureds, the 'cheaper' insurance on regulated jurisdictions reflects the fact that larger subsidies produce lower prices. After considering the problems with the study, Quirin concludes "the study's evidence does not support the conclusion it has drawn from them. The preponderance of empirical evidence from the U.S. supports the view that regulation increases costs to consumers; the results of those few studies with contrary findings are easily explicable in terms of defects in statistical methodology". (p. 31)

Quirin, in his study, concludes that there is no reason to believe that the experience of regulation in Ontario will be any different. The experiences of Nova Scotia and Alberta are not very illuminating since the

regulation does not introduce binding controls on the behaviour of the industry. If regulation is to be imposed in Ontario it should "be of the open competition variety in effect in California. As a next best, a file-and-use model could be imposed. No economic case can be made for more stringent regulation." (Quirin) In fact, Quirin suggests that binding regulation may result in the withdrawal of existing insurance company capacity.

ENDNOTES

1. The profit relationship is written as follows:

$$\text{Profit} = (P^* + E)(r_p) + P(1 - L - v) - F$$

where

Profit = expected profit to equityholders

P^* = premium dollars generated for investment

E = equity dollars invested in investment portfolio

r = expected rate of return on investment portfolio

L = expected loss ratio = expected claims/premiums

v = expected expense ratio = expected expenses/premiums

F = fixed costs

P = actual premiums collected

2. In equilibrium, it is expected that

$$1 - L - v = -rS$$

where $S = P^*/P$ and can be greater than unity, and r is the risk-free interest rate. This relationship reflects the expected result but since L , v and even r can be random variables, it is likely that this relationship will not hold using actual results for a particular year.

A COMPARISON OF THE CAR
INSURANCE INDUSTRY IN
ONTARIO WITH THE PUBLIC
MONOPOLIES IN
BRITISH COLUMBIA, MANITOBA
AND SASKATCHEWAN

Prepared for the Inquiry Into Motor Vehicle Accident
Compensation in Ontario

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I. BACKGROUND

Before examining the fairness of insurance rates or prices and the various systems that exist in Canada, it is important to understand the nature of the product, that is, the types and extent of coverage that automobile insurance policies provide under each of these systems. Across Canada, the standard automobile insurance policy is composed of three sections: third party liability (also known as bodily injury and property damage), accident benefits, and collision.

Third party liability coverage protects the insured against liability imposed by law for loss or damages resulting from the ownership, use or operation of the automobile, and resulting from bodily injury to or the death of any person, or damage to property. This coverage applies to both the insured and anyone who uses the vehicle with the insured's consent. This coverage is compulsory in all provinces and has been so in Ontario since 1980. While Ontario has had some difficulty in enforcing this law (estimates have put the percentage of uninsured motorists as high as 15%), public insurers have been successful in tying insurance to vehicle registration so that a motorist must be insured in order to register his/her vehicle. As a result of this and the lower rates charged high risk drivers, it appears that uninsured drivers are not a big problem in the provinces with public insurance. The minimum level of coverage in all provinces is \$200,000, but excess coverage can be purchased if desired.

Claims on third party coverage partly result from court awards, so that legal trends, in addition to inflationary cycles, dictate changes in average claim costs. Skyrocketing court awards in recent years have caused third party claims costs to increase by 64% (1986 Green Book) since 1982 in the private sector, providing much of the impetus for increasing insurance premiums.

The second section of an insurance policy provides accident benefits coverage, including medical payments, funeral expenses, disability income benefits and death benefits, regardless of fault. Medical payments coverage is meant to cover the doctor, hospital and rehabilitation costs; funeral expenses and death benefits are meant to compensate the insured's family should death result from an accident; and disability income benefits compensate for

temporary or permanent losses of income as the result of an accident. In most provinces, the medical benefits are integrated with the provincial health system and direct payments are made to the province in lieu of case by case reimbursement.

Accident benefits coverage is compulsory across Canada, although the extent of coverage varies from province to province. Ontario's coverage compares favourably with other provinces, providing similar medical, funeral and disability benefits and death benefits which are superior to those in B.C. and Saskatchewan. In comparison with third party coverage, accident benefits up to the scheduled limits are not subject to the tort system, and partly as a result, the average claims cost of accident benefits policies has increased only 37% since 1982. In Ontario, claims above the scheduled limits can be made through the tort system. Table 1 gives details of the compulsory coverage for Ontario and the three public plans.

The third section of the Standard Automobile Policy is optional and deals with collision coverage. Coverage can include a wide range of specified perils depending on which of four levels of coverage is chosen. All perils coverage indemnifies the insured against direct and accidental loss of or damage to the automobile, including its equipment, from all perils, as specified; Collision or Upset coverage protects the insured against only loss or damage caused by collision with another object or by upset; Comprehensive coverage provides compensation for damages other than by collision or by upset; and Specified Perils coverage is limited to damage caused by fire, lightning, theft or attempt thereat, windstorm, earthquake, hail, explosion, riot, falling or forced landing of aircraft or of parts thereof, rising water, or the stranding, sinking, burning, derailment or collision of any conveyance in or upon which the automobile is being transported. These coverages almost always include a deductible portion which forces the insured to pay a specified initial amount of any claim. This 'co-insurance' ensures that the risk of having an accident does not appreciably change after insurance is taken out.

The costs of collision claims are affected mainly by inflation in automobile repair and replacement costs. Since 1982 the average cost of such claims has risen by only 25%. Note that 'fault' is defined in many accidents

on a formula basis i.e., one car rear-ending another is always at fault. As a result, in most car accidents there is no resort to the tort system to settle collision claims. This innovation by private insurance companies was designed to minimize the legal cost component of claims costs.

TABLE 1Automobile Insurance Coverage

THIRD-PARTY LIABILITY	SASKATCHEWAN COMPULSORY	MANITOBA COMPULSORY	B.C. COMPULSORY	ONTARIO COMPULSORY
MAXIMUM BENEFITS	\$200,000	\$200,000	\$200,000	\$200,000
ACCIDENT BENEFITS	COMPULSORY	COMPULSORY	COMPULSORY	COMPULSORY
DEATH BENEFITS				
-Time Limit	2 Years	None	None	2 Years
-Primary Dep.	\$10,000	\$10,000	\$5,000+\$130/wk*	\$10,000
-Secondary Deps.	1,500	2,000	1,000+\$30/wk*	1,000
-Spouse	2,500	10,000	2,500	10,000
-Dependent Child	2,500	2,000	1,500 Max *for 104 weeks	2,000
MEDICAL EXPENSES	\$10,000 Max	\$20,000 Max	\$100,000 Max	\$25,000 Max
FUNERAL EXPENSES	None	1,500 Max	1,000 Max	1,000 Max
DISMEMBERMENT	\$10,000 Max	\$20,000 Max	Not Covered	Not Covered
LOSS OF INCOME				
-Full-Time Empl.	\$150/wk Max	\$150/wk or 70% of Gross Wages Max.	75% of Gross Wages	80% of Gross Wages
-Homemaker	\$150/wk	\$150/wk	\$145/wk	\$70/wk #
-Partial Disability	\$75 /wk	\$60/wk	None	None
- # of Weeks	104	104	104	104 # for 12 wks
COLLISION	COMPULSORY ALL PERILS	COMPULSORY ALL PERILS	OPTIONAL	OPTIONAL
DEDUCTIBLE (BASIC)	\$500	\$200	Varies	Varies

II. A MODEL OF A CASUALTY INSURANCE COMPANY

There are two key features that differentiate the products of a casualty insurance company from other consumer products: time and uncertainty. The time dimension is the fact that for a premium today, an insurance company agrees to reimburse its policyholder at some point in the future. For car insurance companies this time in the 'future' is relatively short, since the accident must occur during the current policy year; payment may then be pushed further into the future as a result of delay by the policyholder in reporting the claim, time for litigation and the company in settling it. The uncertainty stems from the fact that the individual policyholder does not know whether or not he/she will have an accident and thus require reimbursement.

From the company's point of view these two key features of insurance in turn introduce two key operating characteristics: first, the firm will earn a return by investing the premium paid by the policyholder and second, the firm will have to write a large number of policies to diversify the risk of any individual policy. In many branches of insurance, e.g., life insurance, the risk can be largely removed by pooling it with other risks, so that an actuary can work out fairly accurately how much will have to be paid out on each policy and how variable will be the total payout by the firm. With car insurance, given the common nature of claims costs, pooling cannot eliminate all risk. However, given the variability that remains, the firm can determine how much equity capital is required as a cushion to ensure that a bad year of losses does not force the firm into bankruptcy.

Given these two key characteristics of insurance we can create a simple single period model of an insurance company, whereby a firm raises equity capital and writes insurance policies against that capital. If the policies all mature in one year's time, the firm will invest both the premium income and its capital in the interim, then at the end of the year it will liquidate its investment portfolio and pay out on its claims, distributing the residual as a dividend to its common stockholders, or to its policyholders if it is a mutual company, or retaining it in order to write more policies. If the claims exceed the investment income and the original policy income, then the return on equity will be negative and vice versa.

Given this underlying model we can represent the profitability (Π) of a casualty insurance company as

$$\tilde{\Pi} = \tilde{r}_S S + \tilde{r}_B B + P(1 - \tilde{L}) - vP - F \quad (1)$$

where r_S and r_B are the returns on the stock (S) and bond (B) investments respectively, which for simplicity we assume are the only eligible investments, P is the amount of premium income generated, L the loss ratio and v and F the variable and fixed costs respectively. For the casualty insurer, r_S , r_B and L are uncertain, which is represented by the tildes (\sim).

The key requirement now is to value the uncertain profit stream. To do this we use the Capital Asset Pricing Model (CAPM) developed by William Sharpe (1964) and John Lintner (1965) and previously used to evaluate insurance companies by Hill (1979) and Fairly (1979). The CAPM has become the most widely used model for valuing uncertainty since it specifically uses the benefits of diversification. Since some of the fluctuation or uncertainty in any security's return is unique to that security, risk can be reduced by holding a portfolio of securities. This obvious extension of the basic advice of 'not putting all your eggs into one basket' has some profound implications for valuing securities. Since individuals will diversify, either directly or indirectly through mutual funds and financial institutions, the risk of any security should be measured by its contribution to the risk of a diversified portfolio. This is what is termed systematic or market risk.

In theory, individuals will continue to reap the diversification gains until they hold all the risky securities that exist, a portfolio that is termed the market portfolio. In practice, such extremes in diversification are rarely found, but the high correlation between the rates of return on diversified portfolios allows us to use the market portfolio as a benchmark. This then allows us to look at risk measure related to the underlying variables, which are not unique to individual investors.

The CAPM values the uncertain profit stream to the equity holder as

$$V = \frac{E + \Pi - \lambda \text{cov}(\Pi, R_m)}{1+r} \quad (2)$$

where V is the value of the firm, E is the original equity contribution, Π is the expected profit or cash flow stream, r is the risk-free interest rate, $\text{cov}(\Pi, R_m)$ is the covariance between the uncertain profits and the return on the market portfolio and λ is the market price of risk. The objective of the firm is to make decisions today to maximize the net present value of the equity, i.e., the difference between the market value of the equity and the original amount of equity investment. Substituting (1) into (2) gives

$$\max Z = \frac{r_s S + r_B B + P(1-L) - vP - F - \lambda \text{cov}(r_s S + r_B B + P(1-L), R_m) - rE}{1+r} \quad (3)$$

Moreover, there is the basic balance sheet constraint,

$$B + S = P + E \quad (4)$$

that is, the investment in securities comes from the policyholders via premiums and equity holders via their original investment. Hence, using (4) in (3) we have

$$\max Z = \frac{(r_s - r)S + (r_B - r)B + P(1-L) - vP - F + rP - \lambda \text{Cov}(r_s S + r_B B + P(1-L), R_m)}{1+r} \quad (5)$$

which is our basic valuation equation.

The model represented by equation (5) is very simple; however, it captures the basic notion of a casualty insurer. In practice, of course, firms do not operate within a single period framework; policies are written continuously and claims are settled continuously. However, within any fixed period the flow equation representing profits is approximately correct, except for the fact that the true loss ratio can only be approximated. Similarly, in equation (4) not all of the premium revenues are invested in securities. In practice, premiums generate funds for investment in two ways. First, some policies will overlap the fiscal year, hence some of the premium revenues are unearned and thus represent a liability to policyholders. Similarly, some of the claims cannot be settled during the

year and thus a reserve for unsettled claims has to be established. In both cases, for an ongoing firm, permanent capital is effectively provided by the policyholders. To recognize this fact we simply rewrite the balance sheet constraint of equation (4) to get

$$B + S = \gamma P + E \quad (6)$$

where γ is the proportion of policy premiums that accrues as capital for the firm to invest.

Our unregulated casualty insurer is thus faced with the following net present value maximization problem

$$\max_{S, B, P} Z = \frac{(r_S - r)S + (r_B - r)B + P(1 - L) - vP - F + r\gamma P - \lambda \text{cov}(r_S S + r_B B + P(1 - L), R_m)}{1 + r} \quad (7)$$

where the two crucial management decisions are (1) the volume of insurance policies to underwrite represented by P and (2) the level of investment risk to undertake represented by S and B . This former decision can be termed the 'insurance exposure' decision and the latter decision the 'investment exposure' decision.

The optimality conditions are:

$$S: \quad r_S - r - \lambda \text{cov}(r_S, R_m) = 0 \quad (8)$$

$$B: \quad r_B - r - \lambda \text{cov}(r_B, R_m) = 0 \quad (9)$$

$$P: \quad 1 - L - v + r\gamma - \text{cov}(1 - L, R_m) = 0 \quad (10)$$

Equations (8) and (9) are just the rate of return formats of the CAPM. The interpretation is straightforward. If the casualty insurer feels that the expected rate of return on either bonds or equity (r_B, r_S), exceeds their risk adjusted costs ($r + \lambda \text{cov}(r, R_m)$), then more of that investment should be purchased. This is simply the standard investment decision rule whereby the investment manager invests funds into those investments that are anticipated to 'beat the market'.

The insurance decision of equation (10) is also straightforward. The loss ratio for casualty policies is essentially unrelated to the return on the market portfolio, since whether or not it is a good or bad claims

year is essentially unrelated to whether capital markets are depressed or buoyant. Hence, $\text{cov}(1-L, R_m)=0$. In this case, we have the basic criteria

$$1-L-v = -r\gamma \quad (11)$$

which indicates that insurance premiums will be written until the expected marginal underwriting return, (one minus the expected loss ratio minus the variable costs) is negative.

The reason why the underwriting return is negative is that each policy written contributes to the capital of the firm through loss reserves and unearned premium income. The amount of free capital so contributed depends on the parameter, γ , the higher this parameter is, the more free capital is generated. Hence, since this capital is invested at least at the risk-free rate of return (r), the casualty insurer will keep writing policies until the loss on underwriting is just offset by the investment income so generated.

It is thus a cardinal rule in evaluating the performance of casualty insurers that we would expect to find underwriting losses. This does not mean to say that we will actually find them, since in any one particular year the actual loss ratio may be higher or lower than expected. Thus it is possible that in a good year underwriting income may even be positive. It is also true that as capital market conditions change, so too will the insurance market. From equation (11) it is apparent that as market interest rates rise, so too will the underwriting losses, since insurers will be scrambling to book more policies and thus have more money to invest in securities.

The foregoing model is appropriate for an unregulated public insurance company, because no constraints or corporate taxes have been imposed on it. As a result, insurance exposure and investment exposure are separate problems. Such a model might be appropriate for public insurance companies that do not fall under the jurisdiction of the Federal Superintendent of Insurance. However, for private casualty insurance companies, in addition to corporate taxes, there are a host of constraints on their operations that cause this separation of management decisions to break down.

The principal restriction that we will examine is the capital restriction that determines the multiple of premium income that can be earned for each dollar of equity capital. Although this multiple varies by province and size of insurer, we will denote it by a constant α . For most firms this restriction is binding, that is, a competitive firm would desire to write more policies per dollar of equity capital. It is because a competitive firm would operate with less capital, and thus a higher risk of bankruptcy and insolvency, that the Superintendent of Insurance imposes a capital restriction.

For our purposes it means that premium income is a function of the equity capital of the insurance company, i.e., $P = \alpha E$, where in most jurisdictions $\alpha = 3$. Hence, since the constraint is binding, the amount of equity determines the value of premium revenues that can be earned and the value of the investment in securities, since the investment by policyholders (γP) also becomes a function of the size of the equity. Hence, the balance sheet constraint becomes

$$B + S = \gamma \alpha E + E = E(1 + \gamma \alpha) \quad (12)$$

The total investment decision is now fixed by the equity and underwriting decision; all that remains is the composition of the investment portfolio.

The introduction of corporate taxes and regulation thus changes the model of equation (7) to

$$\max_{E, \delta} Z = \frac{(1-t)[(1+\gamma \alpha E r_p + \alpha E(1-L-v)) - F - \lambda \text{Cov}((1+\gamma \alpha) r_p + \alpha E(1-L), R_m) - r_F]}{1+r} \quad (13)$$

$$\text{where } r_p = \delta r_s + (1-\delta) r_B.$$

The key values are the composition of the investment portfolio, determined by the proportion invested in equities (δ) and the proportion in bonds ($1-\delta$), and the scale of the firm, determined by the size of the equity (E). The level of premium income (αE), the capital contributed by policyholders ($\gamma P = \gamma \alpha E$), and the size of the investment portfolio ($(1+\gamma \alpha)E$) are all then fixed by the parameters and the size of the equity.

The optimality conditions are then

$$\delta: r_s - \lambda \text{cov}(r_s, R_m) - r_B + \lambda \text{cov}(r_B, R_m) = 0 \quad (14)$$

$$E: (1-t)[(r_p - \lambda \text{cov}(r_p, R_m)(1+\gamma\alpha) + \alpha(1-L-v)] - r = 0 \quad (15)$$

where r_p in equation (15) is the optimal portfolio return found from equation (14). As before, the investment decision depends on the expected return on the bond and equity investments, relative to their risk-adjusted rates of return. Unlike equations (8) and (9), however, equation (14) just determines the mix of the optimal portfolio and not its size. If the risk-adjusted equity return ($r_s - \lambda \text{cov}(r_s, R_m)$) exceeds the risk-adjusted bond return ($r_B - \lambda \text{cov}(r_B, R_m)$), then the proportion invested in the stock market (δ) goes up. However, without any special investment timing skills, equation (14) will be zero, indicating no special investment mix.

Our concern is with the size of the insurer because of its relationship to the pure insurance results. If we rearrange equation (15) by noting that $r = r(1+\gamma\alpha) - r\gamma\alpha$, then we can get

$$(1-t)(1-L-v) = -r\gamma - ((1+\gamma\alpha)/\alpha)((r_p - \lambda \text{cov}(r_p, R_m)(1-t) - r) \quad (16)$$

which should be compared to equation (11). Note that it is a condition of capital market equilibrium that $r_p - \lambda \text{cov}(r_p, R_m) = r$, that all risk adjusted expected rates of return should be equal. If we use this condition we can simplify equation (16) to get

$$1-L-v = (-r\gamma + ((1+\gamma\alpha)/\alpha)rt)/(1-t) \quad (17)$$

which indicates that the capital constraint interacts in an interesting way with the imposition of corporate income taxes.

In the unregulated public insurance company problem the investment and insurance exposure problems were separate. This is not the case for the private insurer because the regulator insists on a substantial cushion of bond and equity investments to ensure that the company survives to pay off on its liabilities (claims). However, the income from this investment portfolio is taxed along with any underwriting profits. From the investor's point of view an investment in bonds and equities can be made without the extra layer of taxation imposed at the corporate level, either by investing directly or by investing through a

mutual fund. Hence, the underwriting operation has to be more profitable to compensate the insurance company investor for this extra layer of taxation.

If in equation (17) we set $t=0$, we get the same result as in equation (11). However, as t increases, the private insurer has to have a lower and lower loss ratio (L) to compensate for the extra taxes paid on the company's investment operations. This can be seen by further rearranging equation (17) to get

$$L = 1 - v + [r\gamma - ((1 + \gamma\alpha)/\alpha)rt] / (1 - t) \quad (18)$$

as a market equilibrium condition i.e., an equilibrium loss cost such that the private insurer will have no incentive to change the scale of the company's insurance operations. In Table 2 we show how the loss cost ratio declines as the corporate tax rate increases, given reasonable numbers for the other variables.

If we reject market equilibrium and allow the investment manager to believe that he can beat the market, then the risk-adjusted expected rate of return ($r_B - \lambda \text{cov}(r_B, RM)$) exceeds the risk-free rate in equation (16) and the investment manager believes that his market portfolio is undervalued. In this case the casualty insurer will write more policies in order to generate the premium income to invest in the 'undervalued' securities. As a result, the loss ratio will increase. This situation is illustrated in column B of Table 2, where with some hypothetical numbers the loss ratio increases by some 3%, when the investment manager believes the market is undervalued on an expected return basis by 2%. Note that unlike the unregulated insurer, the investment decision is inextricably linked with the insurance decision, since the equity constraint forces the insurer to have excess equity capital.

The true implication of this Table 2 is that when the capital market is buoyant and investment managers feel that the market is undervalued, then we should expect that private regulated casualty insurers have even bigger underwriting losses than the unregulated public insurers, i.e., the provincial insurers, since these companies have no incentives to use premium income as a source of funds to enhance the value of private equity. When this buoyant market coincides with high nominal interest rates, we

would expect very large underwriting losses, as the effects compound each other.

TABLE 2

Equilibrium Loss Costs and The Corporate Income Tax

Corporate Tax Rate	A Loss Cost	B Loss Cost
0	0.859	0.887
0.05	0.857	0.886
0.1	0.855	0.884
0.15	0.853	0.881
0.2	0.850	0.879
0.25	0.847	0.876
0.3	0.845	0.873
0.35	0.840	0.870
0.4	0.836	0.865
0.45	0.831	0.860
0.5	0.825	0.854

$$L = 1 - v + [r\gamma - ((1+\gamma\alpha)/\alpha)rt]/(1-t)$$

where v = expense ratio of 0.25

r = interest rate of 0.1

γ = net free liabilities of 1.09

α = premium to equity ratio of 3

risk adjusted return is 12% for B instead of 10%.

This simple model is thus rich enough to capture some of the key features of casualty insurance companies in Canada. Also, from examining equation (16), it is apparent that for the competitive insurance company, the loss ratio, the marginal production cost and the share of premiums available for investment (γ) are largely beyond the control of the firm. Hence, in the long run, when the firm also has to cover its fixed costs we need to examine the following crucial operating characteristics:

- (1) The loss ratio L , which is termed the claims ratio in the Insurance Bureau of Canada's Green Book. This ratio includes not only the payout to policyholders on their claims, but also the adjustment costs required to satisfy the claim.

- (2) The expense ratio $(vP+F)/P$, which is the variable costs (commissions, premium taxes, etc.) as well as the corporate overhead as a percentage of net premiums earned.
- (3) The proportion of funds per dollar of premium income which is available to the insurance company for investment purposes (γ).
- (4) The risk-free return that the insurance company can expect to earn on the funds available from policyholders.

These four key operating characteristics determine the behaviour of casualty insurance companies. In addition, we will also examine what is called the pure premium which is just the claims and adjusting costs for various categories of car insurance, for example, the overall pure premium is just LP , the average amount spent on settling all claims.

One final note before examining actual performance is that the investment income attributable to underwriting is only the risk-free return on the capital provided by policyholders. If the company decides to invest in risky securities, such as equities and corporate bonds or in real estate, the surplus or shortfall in investment income flows through to the common stockholders. That is, if investment income falls, this drop in income reduces the stockholder's income and should be separated from the underwriting results, and conversely if investment income increases. In this sense, the capital provided by policyholders is effectively an interest-free loan; competition amongst insurers ensures that it earns the risk-free rate. Investment income only affects the underwriting results because of the 'free funds' made available to the insurance company due to the unearned premiums and premium reserves that automatically arise as a result of doing business.

In this model no 'equity' is allocated to the underwriting operations since although, periodically, infusions will be made to support 'bad' underwriting results and dividends will be taken out with good operating results, overall underwriting results are unsystematic and no cost is attached to the cost of providing a 'cushion' for this uncertainty. This result holds whether the insurer is a

public insurance company, where the cushion is provided by the province's exchequer, or a private insurance company, where the cushion comes from the firm's portfolio of investments. The only extra 'cost' that needs to be allocated to the private firm's underwriting operations comes from the tax effect discussed earlier. The parallel of our model to the normal financial leverage model is discussed in the appendix.

APPENDIX

In our model, profits are

$$\Pi = r_S S + r_B B + P(1-L-v) - F \quad A(1)$$

however, we can define the portfolio rate of return as $r_p = \delta r_S + (1-\delta)r_B$ where δ is the portfolio weight for the equity market and all funds are invested. Inserting this specification, and noting the balance sheet constraint $B+S=\gamma P+E$ into A(1) gives

$$\Pi = r_p(\gamma P + E) + P(1-L-v) - F \quad A(2)$$

In the long run, both variable and fixed costs are variable and equal to the expense ratio $v+F/P$. In this case, we can use the long run equilibrium version of equation (11), i.e.

$$1-L-(v+F/P) = -r\gamma \quad A(3)$$

to substitute into A(2). If we then divide through by the equity amount (E) and define in the normal way the return on equity as Π/E , we get

$$ROE = r_p + (r_p - r)\gamma P/E \quad A(4)$$

which is the normal financial leverage equation found in any introductory finance textbook, once we realize that γP is debt. The insight of our model is that the cost of debt (γP) is met by reducing premium rates and implicitly paying the interest rate r , rather than the direct payment as with normal debt.

III. PERFORMANCE EVALUATION OF CASUALTY INSURERS IN ONTARIO

A. Claims Ratios

Table 3 gives the recent performance of various claims ratios for automobile insurers in Ontario over the three main product lines based on direct premiums written. If the good news is given first, it is that the claims ratios for personal accident benefits and other coverage (collision, all perils, comprehensive, etc.) have been relatively stable. The 'other' claims ratio in 1985 was 72.3%, insignificantly different from its six year average of 73.7%. Similarly, the claims ratio for personal accident coverage of 89.9%, although significantly higher than its six year average of 80.5%, was down from the 96.9% level of 1984. For both these types of coverage it appears that premiums are at least covering the payout to policyholders and marginal adjustment costs.

Figures 1A and 1B graph the claims ratios for personal accident insurance and collision for Ontario and the rest of Canada respectively, where the rest of Canada also excludes B.C., Manitoba and Saskatchewan. The striking result here is that the claims ratio for personal accident insurance in Ontario is much higher than in the rest of Canada. However, given the substantial regional variation in personal accident coverage, not too much importance can be attached to this observation. In contrast, the claims ratio for 'other' seems to be essentially the same in Ontario as in the rest of Canada. In summary, personal accident and 'other' coverage seem to be under control, in the sense that the claims ratios do not seem to exhibit any trend, and the performance in Ontario largely mirrors that in the rest of Canada.

The bad news is that the claims ratio for third party liability for bodily injury and property damage has increased in Ontario for each year since 1980. Moreover, for the last three years the claims ratio has exceeded 100%, which means that the payout to claimants plus adjusting expenses has exceeded the value of the premium income. Since the claims ratio does not include any allocation of general expenses, it is quite obvious that the premiums charged for bodily injury and property damage have been lower, relative to the costs incurred in meeting claims. Figure 2A shows that for third party liability,

TABLE 3Automobile Loss Ratios in Ontario

	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>	<u>1981</u>
A) TOTAL					
Direct Premiums Written	2050.7	1984.1	1905.7	1769.0	1502.0
Direct Losses & Adjustment	2055.9	1888.3	1599.2	1424.4	1270.0
Loss Ratio	100.3	95.2	83.9	80.5	84.5
B) THIRD PARTY LIABILITY					
Direct Premiums Written	1078.1	1024.1	984.9	903.7	787.5
Direct Losses & Adjustment	1329.3	1204.5	993.4	819.5	695.9
Loss Ratio	123.3	117.5	100.9	90.6	88.3
C) PERSONAL ACCIDENT					
Direct Premiums Written	131.8	131.4	120.0	117.2	108.7
Direct Losses & Adjustment	118.5	127.4	101.4	86.3	77.3
Loss Ratio	89.9	96.9	84.5	73.6	71.0
D) OTHER (collison, etc.)					
Direct Premiums Written	840.7	828.6	800.7	748.7	605.8
Direct Losses & Adjustment	608.1	556.4	504.4	518.6	496.9
Loss Ratio	72.3	67.1	63.0	69.3	82.0

Source: Federal and Ontario Reports of the Superintendents of Insurance.

CLAIMS RATIOS

Personal Accident

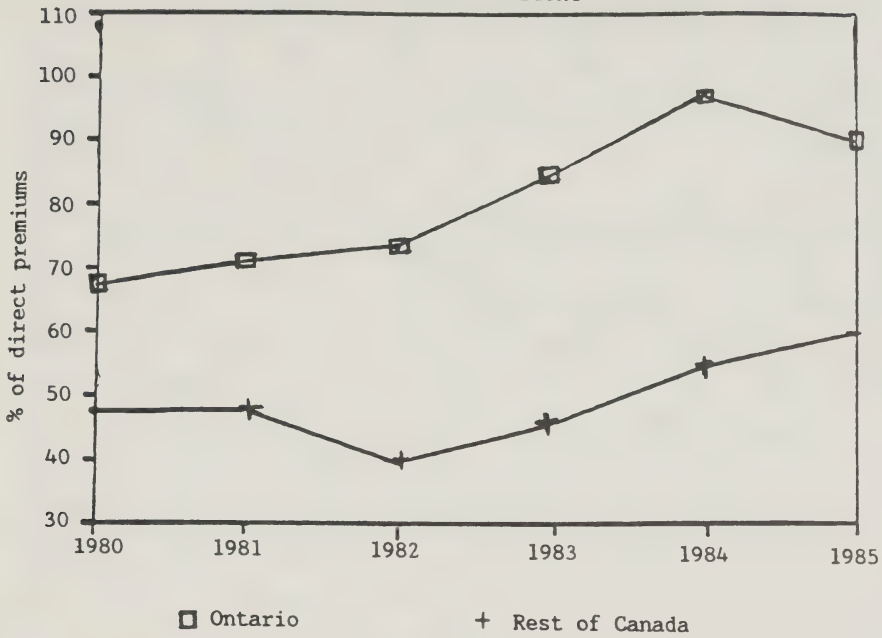


FIGURE 1A

CLAIMS RATIOS

Other (Collision)

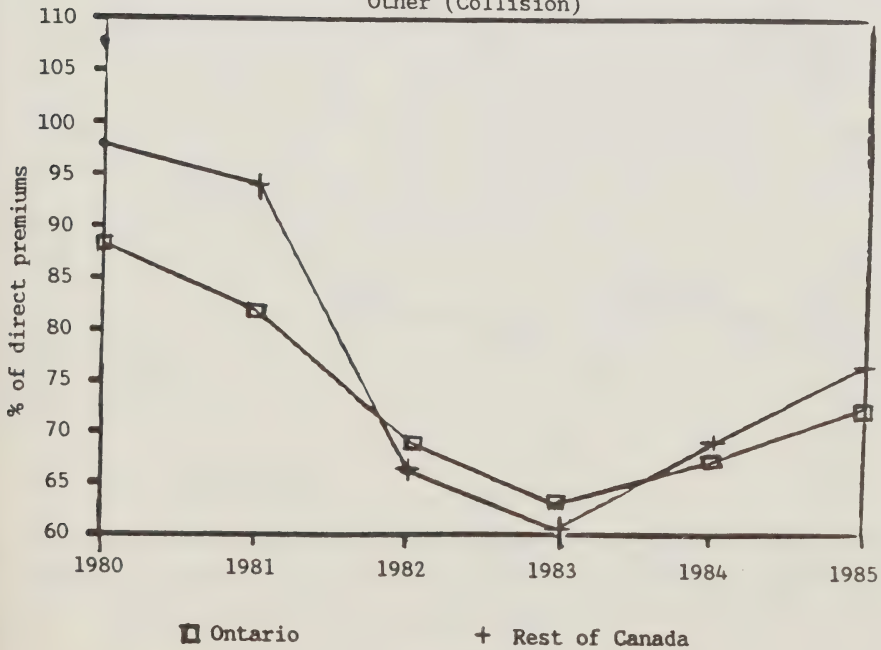


FIGURE 1B

CLAIMS RATIOS

Third Party Liability

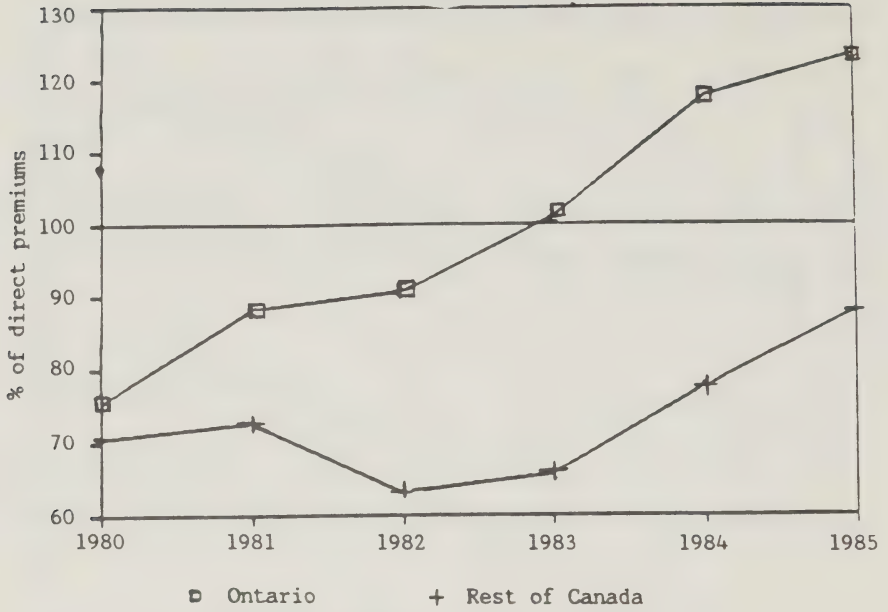


Figure 2A

CLAIMS RATIOS

All Auto Insurance

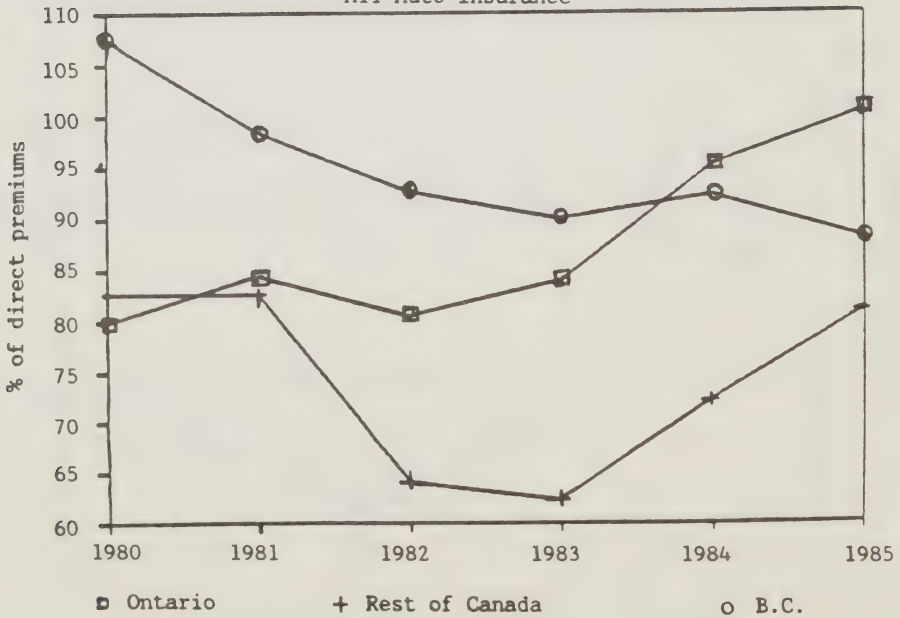


Figure 2B

the claims ratio for Ontario has deteriorated much more dramatically than that for the rest of Canada. However, after stabilizing at around 65%, the claims ratio for third party liability in the rest of Canada seems to have caught the Ontario disease and increased quite dramatically in 1984 and 1985. Overall, coverage for third party liability seems to be an existing problem for insurance companies within Ontario and an emerging one for the rest of Canada.

Figure 2B shows the overall claims ratios for automobile insurance in Ontario, British Columbia and the rest of Canada (which again excludes B.C., Saskatchewan, Manitoba and Ontario). This 'total' picture shows the increase in overall claims ratios both in Ontario and the rest of Canada. However, given the previous information, it is apparent that the increase in the overall claims ratio is primarily the result of an increase in the claims ratio for third party liability. Of interest is the observation that the overall claims ratio for B.C. has exhibited a decreasing trend over time, with none of the instability exhibited by the claims ratio in Ontario and the rest of Canada. The other public sector insurers, MPIC and SGI will be analyzed along with ICBC in Chapter III.

One final note is that the claims ratio is a ratio, that is, it is total claims and adjusting costs divided by a measure of premiums written. Hence, there are two important implications. The first is that instability can be generated by either costs or premium trends. The stability in the B.C. claims ratio, as we shall see, is largely the result of the stability in premium levels. The second implication is that the claims ratio is independent of the level of premiums. That is, if loss costs are twice as high in Ontario as elsewhere and premiums were also twice as high, then the claims ratio should be the same. Hence, the claims ratio says nothing about the efficiency of the insurance industry; it simply measures the adequacy of premiums relative to actual claims and adjusting costs.

B. Pure Premiums

The 1986 Automobile Insurance Experience (Green Book) contains details on the frequency of claims in each class and the average cost of settling the claims; the product

of the two is called the pure premium. In essence, the pure premium gives the average charge for each class required to pay the claim and all adjusting costs. It does not include any allocation of corporate overhead, expenses or contribution from investment income. Moreover, within the class, the average quality of risk can change over time, for example as a result of a changing mixture of rural and urban driving in the overall Canada class. Hence, the pure premium cannot rightly be used as the cost of a particular class of insurance. However, it does provide some very important raw data to describe experience across different provinces and classes of risk.

In Table 4 is the average frequency of claims for private passenger cars for the three representative classes of insurance: third party liability, personal accident and collision for the years 1982-1986. Note that differences occur across provinces partly as a result of provincial regulations and partly as a result of changes in the mixtures of risks covered. The two principal differences are that in Quebec third party liability coverage also includes own property damage under the direct compensation agreement and in Newfoundland, where accident benefits exclude medical payments, which are covered separately. If we exclude these anomalies, it is apparent that claim frequency varies, sometimes significantly, across the provinces.

TABLE 4

Claims Frequency
(Average 1982-86)

	<u>Third Party</u>	<u>Accident Benefits</u>	<u>Collision</u>
Alberta	0.0568	0.0064	0.0782
New Brunswick	0.0548	0.0074	0.062
Newfoundland	0.0578	0.001	0.0586
Nova Scotia	0.0496	0.0048	0.0614
Ontario	0.0578	0.012	0.0772
P.E.I.	0.0534	0.0044	0.0644
Quebec	0.0982	0.00085	0.0786
Northwest Territories	0.032	0.0026	0.0504
Yukon	0.0408	0.0042	0.0516

Source: 1986 Green Book

Excluding Quebec for the reasons stated above, the highest frequency of claims for third party liability is found in Ontario and Newfoundland with a claims frequency of 5.78%, i.e., on average 5.78 cars out of a hundred register a claim for third party liability each year. Similarly, for personal accident benefits the highest frequency is in Ontario at 1.2%. For collision, the highest frequency is in Quebec (7.86%) and Alberta (7.82%), Ontario is third at 7.72%. The lowest frequency of claims is found in the Northwest Territories and then in the Yukon with claims frequencies of 3.2%, 0.26%, 5.04% and 4.08%, 0.42%, 5.16% respectively for third party, personal accident and collision. Figures 3A and 3B give the time pattern of the claims frequency for the provinces (excluding Quebec). These indicate no clear trend in the claim frequency.

If all claims cost the same, then logically we would expect premiums to be, on average, highest in Ontario, Alberta and Quebec, lowest in the Northwest Territories and the Yukon and somewhere in between for Nova Scotia, New Brunswick, Newfoundland and Prince Edward Island. The claims cost shown in Figure 4 indicate that they are not the same in all provinces.

Ontario has the highest claims cost for third party liability with a 1982-1986 average claim cost of \$4,126; the only other jurisdictions that come close are the Northwest Territories and the Yukon with average claims cost of \$3,640 and \$3,081 respectively. Note that Quebec's low average cost of \$1,147, as previously mentioned, is the reverse of its high claims frequency since the figure includes own property damage. Ontario also has the highest claims cost for personal accident benefits except for Quebec. Moreover, Quebec's claims cost is unrepresentative, since only four claims were registered in 1986. In contrast, Ontario's average claims cost for collision insurance at \$1,320.40 is the lowest of all provinces.

The interpretation of these basic statistics is quite straightforward. Ontario has a relatively large number of accidents, as reflected in the claims frequency. However, the costs of meeting claims for collision, i.e., repairing cars, etc., after the deductible is relatively low. Where Ontario has problems is in third party liability and personal accident coverage, both of which have relatively

CLAIM FREQUENCY

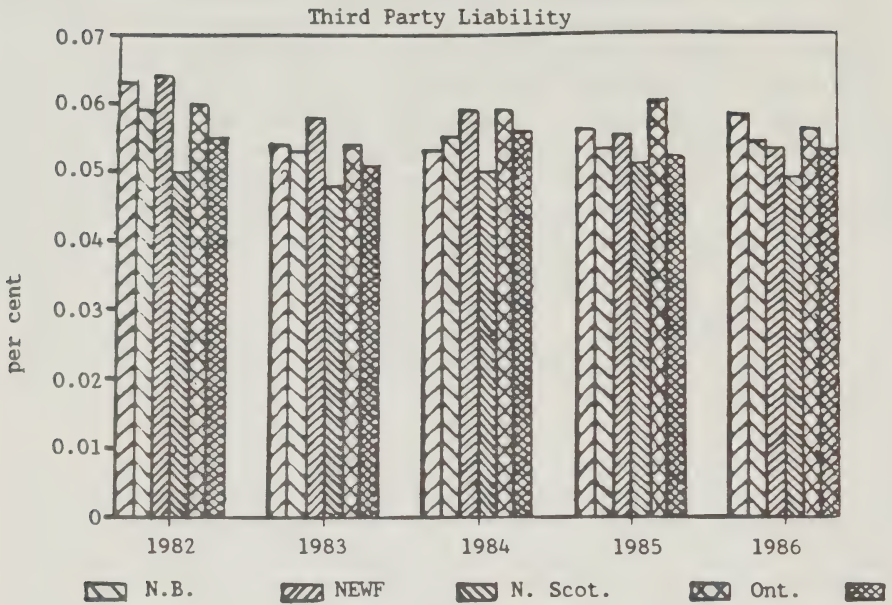


Figure 3A

CLAIM FREQUENCY

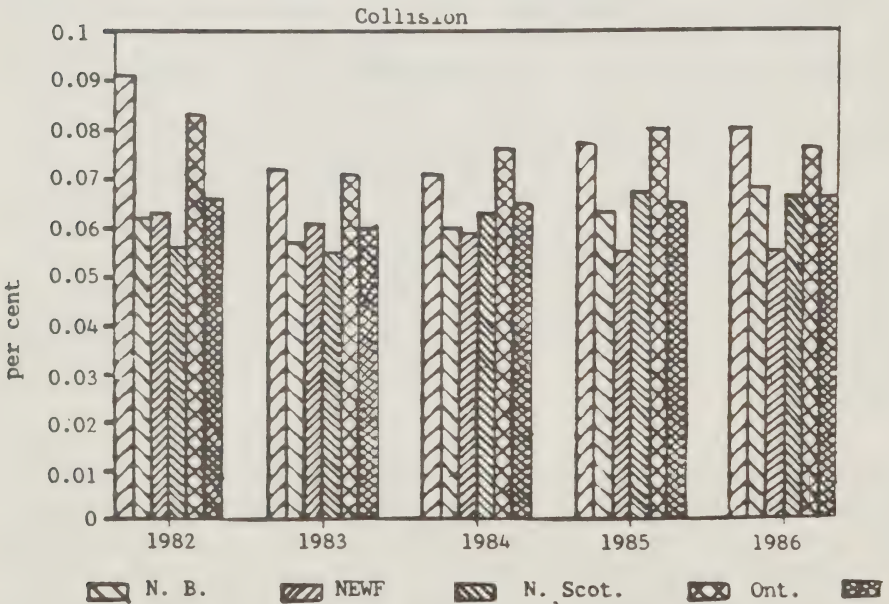


Figure 3B

AVERAGE CLAIMS COST

1982-1986

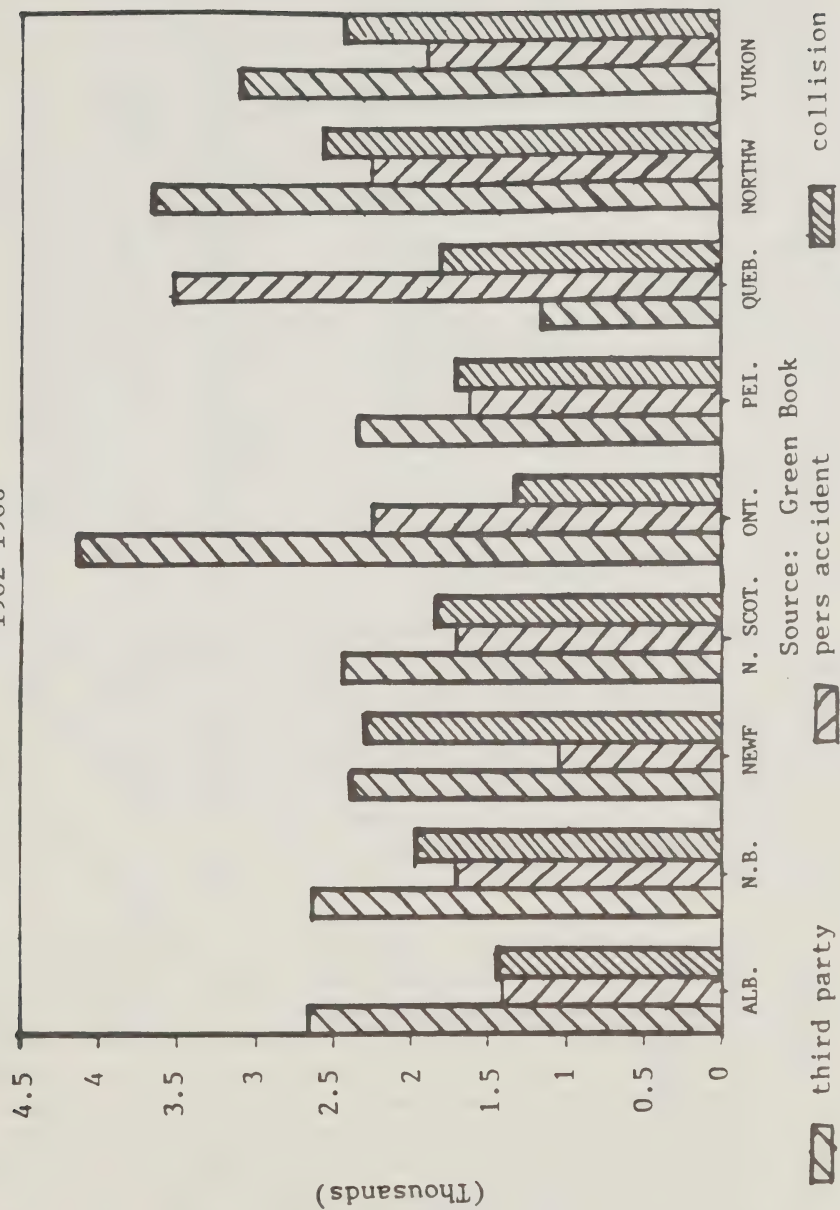


FIGURE 4

high claims costs. If we put the claim frequency together with the average claim cost, we get the pure premiums as shown in Table 5A and Table 5B respectively.

TABLE 5A

Claims Costs (\$)
(Average 1982-86)

	<u>Third Party</u>	<u>Accident Benefits</u>	<u>Collision</u>
Alberta	2647	1415	1425
New Brunswick	2629	1700	1955
Newfoundland	2377	1045	2284
Nova Scotia	2434	1703	1834
Ontario	4126	2242	1320
P.E.I.	2343	1625	1699
Quebec	1147	3520	1794
Northwest Territories	3640	2242	2551
Yukon	3081	1870	2392

Source: 1986 Green Book

Ontario's pure premium for third party liability is \$238.1, \$27.0 for accident benefits and \$101.8 for collision. The pure premium for collision is lower than for the other jurisdictions and the personal accident pure premium is small. This means that when we construct an average pure premium consisting of coverage for third party liability, personal accident and collision, Ontario's average of \$366.9 is \$89.3 more than for the next highest province.

Moreover, while it is appropriate to calculate average claim frequencies because no trend seems to be evident, the claims costs themselves have not been stationary. Figure 6 provides the trend in claims costs for Ontario from 1982-1986. Clearly, the cost of settling third party liability claims has risen much faster than for claims for personal accident benefits or collision. Over the five year period, third party liability claims costs in Ontario have grown by 70%, personal accident benefit costs by 27.1% and collision costs by 38.3%. Hence, in Table 5B the 1986 pure premium is in excess of the average for 1982-86 for all jurisdictions, except for the Northwest Territories. For Ontario the 1986 pure premium is \$442.1, which is \$110 higher than for the next highest province.

TABLE 5BPure Premiums

	<u>Albt.</u>	<u>N.B.</u>	<u>Nfld.</u>	<u>N.S.</u>	<u>Ont.</u>	<u>P.E.I.</u>	<u>Que.</u>	<u>N.W.T.</u>	<u>Yuk.</u>
Third Party Liability	150.2	143.6	136.3	120.6	238.1	124.5	112.9	116.5	123.0
Personal Accident	9.1	12.6	1.0	8.7	27.0	7.5	3.4	5.6	8.2
Collision	111.5	121.4	133.5	112.7	101.8	109.4	141.4	128.0	123.2
Average Premium	270.7	277.6	270.8	242.0	366.9	241.4	257.7	250.1	254.4
1986 Pure Premium	318.9	331.5	289.1	296.3	442.1	209.8	289.9	221.1	276.0

Source: 1986 Green Book

TRENDS IN CLAIMS COSTS

1982-1986 (Ontario)

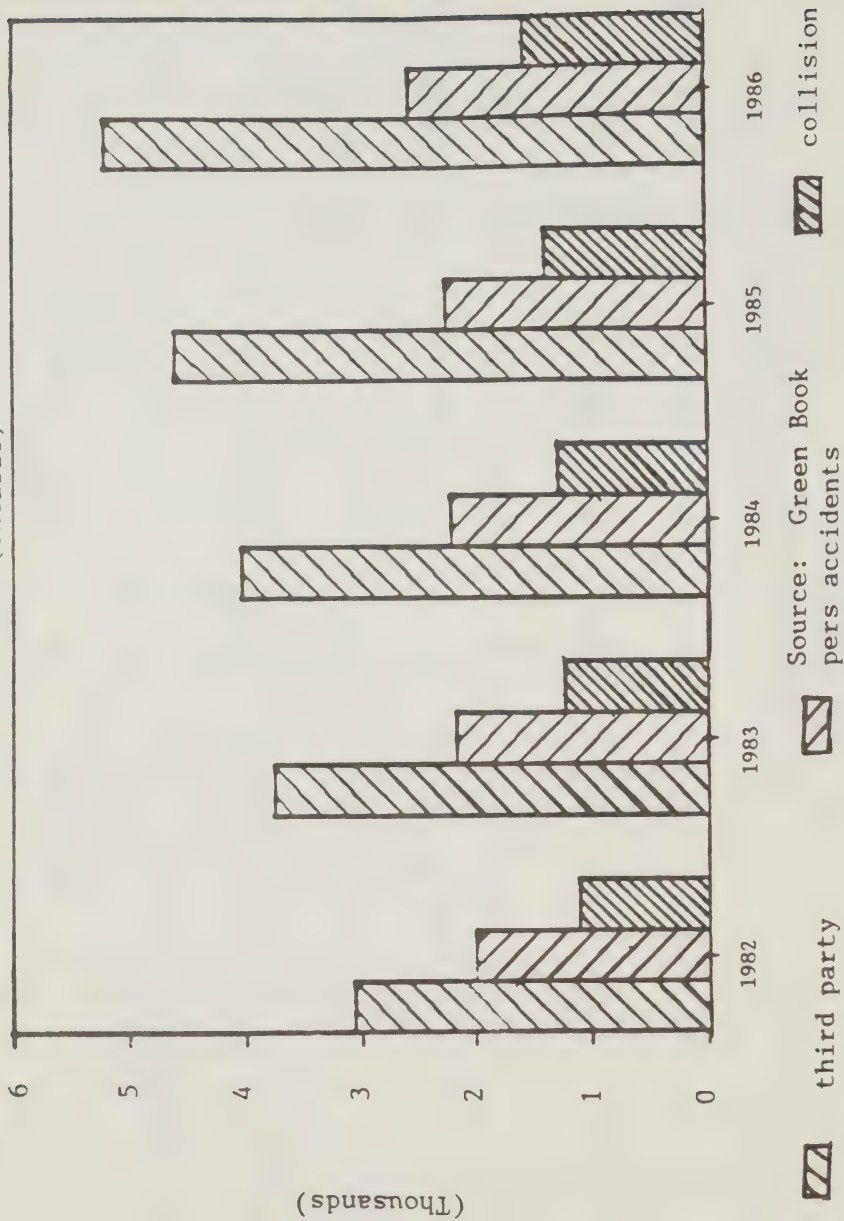


FIGURE 6

Pure premiums, it should be reiterated, are not what the policies should cost. They do not include any expenses allocated or incurred, or investment income, and no allowance is made for changes in the quality of the risks over time. However, they do indicate that the basic building blocks for determining the level of insurance premiums should vary across the different provinces. Some of the differences in claims frequency and claims costs are just statistical differences due to particular experience and should be ignored, since they do not reflect expected values. However, what cannot be ignored is that the overall pure premium for Ontario is substantially higher than for any other province. Moreover, this difference is not caused by claims frequency or the cost of repairing the vehicle owned by the policyholder, but by the cost of meeting third party claims for bodily injury and property damage.

C. Operating Expenses

After claims costs the second major cost component for a casualty insurance company is its operating costs. Each year the Insurance Bureau of Canada collects data from the major insurance companies in Canada that in aggregate write about 95% of total premium income. This data is then circulated to interested parties on an aggregated basis. The aggregate data for 1985 is shown in Table 6.

Two key points are important. First, the data consists of both variable and fixed costs, for example commissions and taxes are largely variable costs while licence fees and other operating costs are largely fixed. Second, rather than the classic distinction between variable and fixed costs, the industry distinguishes between claims adjustment costs and general expenses. This is because the adjustment costs are directly associated with the settlement of claims on behalf of policyholders, while general expenses are the costs of maintaining the operation that are not returned directly to the policyholder.

Although, arguably, this difference is one of semantics, since the general expenses are required to service the policyholder just as much as the adjusting costs, 'politically' a low general expense ratio has been used to impute 'efficiency'.

TABLE 6All Canada Expense RatiosAll Companies 1985

	<u>Personal</u>	<u>Property</u>	<u>Auto</u>	<u>Other</u>	<u>Total</u>
Commissions	20.6	19.9	11.7	18.2	15.6
Taxes	3.3	3.2	2.9	2.6	3.0
Licences & Fees	0.5	1.2	0.5	0.4	0.6
Other Operating Expenses	<u>12.5</u>	<u>14.8</u>	<u>9.9</u>	<u>10.9</u>	<u>11.3</u>
Total	36.8	39.0	25.0	32.1	30.4
	=====	=====	=====	=====	=====
Internal Claims Adjustment	5.5	3.0	6.6	3.3	5.5
External Claims Adjustment	<u>3.8</u>	<u>3.9</u>	<u>4.6</u>	<u>11.1</u>	<u>5.1</u>
Total Claims Adjustment	9.3	6.9	11.2	14.4	10.6
	=====	=====	=====	=====	=====

Source: IBC. Expense Allocation Program Results, 1985

We will talk more about the components of these costs shortly, but the first important observation from Table 6 is that the expense ratio based on net premiums earned differs across different segments of the insurance industry. Personal lines coverage, for example, has a general expense ratio of 36.8% and a claims adjustment ratio of 9.3%, whereas the automobile general expense ratio is only 25% and its claims adjustment ratio 11.2%.

This realization that expense ratios differ across different types of insurance lines causes problems in analyzing pure automobile expense ratios. This is because there are very few pure automobile insurance companies and as a result company expense ratios will reflect the particular product mix of the company. That is, a company writing 50% personal lines coverage, 30% other property and 20% automobile coverage should have a different expense ratio than a 100% automobile insurance company. As a result, the only expense ratio data for pure automobile coverage is that provided by the IBC in its annual summary, which unfortunately does not allow us to directly examine the relationship between the size of the company and the behaviour of the expense ratio.

A second implication of Table 6 is that the overall expense ratio for automobile coverage is the lowest of the four major lines at 36.2%, compared to 46.1% for personal lines, 45.9% for other property and 46.5% for other coverage. Moreover, the automobile coverage has the highest relative mix of claims adjustment costs to general expenses at 0.45 (that is $11.2\%/25\%$) whereas the other lines were 0.25, 0.18 and 0.45 for personal, property and other respectively. The interpretation is that not only is the overall expense ratio lowest for automobile coverage, but no other line has a higher proportionate payout in direct claims adjustment costs.

Figures 7A and 7B give the trend in the auto claims adjustment ratio and the general expense ratio since 1981 for Ontario and Canada as a whole. As expected, the ratios are relatively stable. The claims adjustment ratio has come down slightly over time from 11.8% in 1981 to 11.2% for Ontario and from 12.3% in 1981 to 11.2% for Canada as a whole. In contrast, the general expense ratio has remained reasonably constant averaging 25.1% for Ontario and 25.5% for Canada as a whole. Overall, the expense ratios appear to be slightly lower in Ontario than

CLAIMS ADJUSTMENT RATIOS

1981-1985

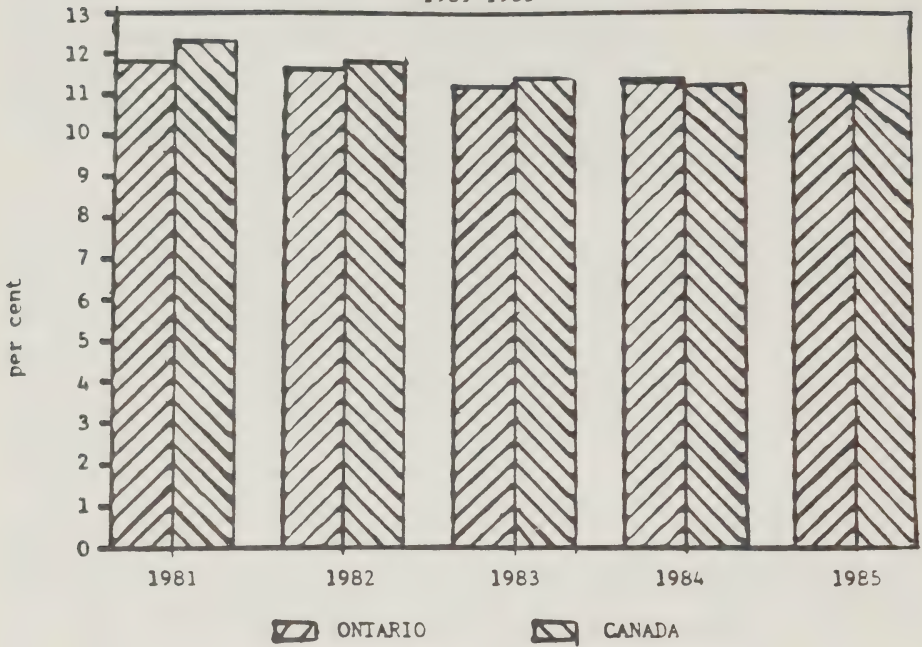


FIGURE 7A

GENERAL EXPENSE RATIOS

1981-1985

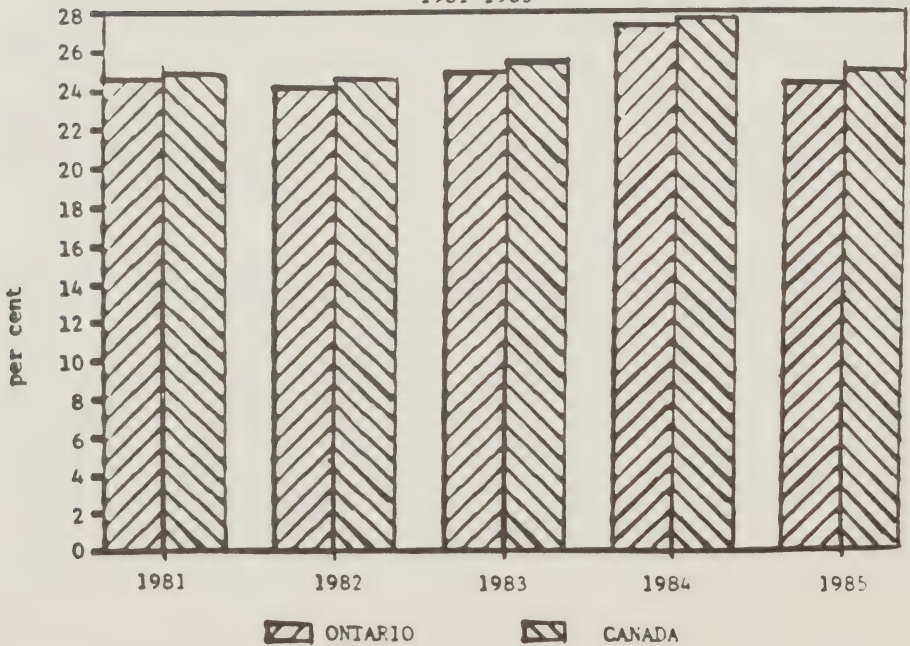


FIGURE 7B

Canada as a whole, a result that would be even stronger if we could back out Ontario's results from the Canada-wide results to get a 'rest of Canada' ratio. Given the recent trend, reasonable expense ratios for Ontario would seem to be 11.2% and 24.5% for the claims adjustment and general expense ratios respectively. We will discuss briefly in an appendix whether or not the general expense ratio varies with the scale of the firm.

In Table 7 we have the breakdown of the general expense ratio for Ontario in 1985. On average, servicing the agency network and acquiring policies cost 17.5% on a fully attributable cost basis, settling and processing claims internally 6.4%, settling and adjusting costs externally 4.8% and underwriting and policy processing 6.8%. However, these expense ratios include an allocation of 4% for general administration and also 0.9% for home office overhead. This allocation is essentially arbitrary, since by definition fixed costs cannot be allocated directly to individual cost centres. However, the total amount involved is small relative to the total expense ratio of 35.5%.

Table 8 gives the expense ratio breakdown for the other provinces. Overall, it appears that the total expense ratio is around 36% except for Quebec, Manitoba and Saskatchewan and Nova Scotia. Manitoba and Saskatchewan will be discussed later, since the ratios here, as for B.C., cover extra coverage provided by private insurers and not the results for the public insurers. It is hard, as a result, not to believe that the general expense ratio for the automobile insurers in the different provinces is basically the same, with differences due to random changes in net premiums earned and the lumpiness of some types of costs from one year to another.

Within the overall expense ratio, there are some differences between the general expense ratio and the claims adjustment ratio across the provinces. Ontario, for example, seems to have a slightly higher claims adjustment ratio and a slightly lower general expense ratio. In contrast, B.C., Manitoba and Saskatchewan have the lowest adjustment cost ratios and a relatively high general expense ratio. However, given the essentially arbitrary nature by which the fixed costs have been allocated, very little can be made of these differences, especially in view of the similarity of the overall expense ratio.

TABLE 71985 Ontario Automobile Expense Ratios

	<u>Agency and Acquisition</u>	<u>Underwriting Settlement Processing</u>	<u>and Policy Processing</u>	<u>General Admin'n.</u>
Commissions	11.5			
Taxes	3.0			
Licences and Assessments	0.1		0.2	0.1
Salaries and Benefits	1.0	3.4	2.4	1.8
Rent, Taxes and Upkeep	0.2	0.3	0.4	0.4
Printing and Stationery	0.1	0.1	0.2	0.2
Home Office Expense	0.1	0.2	0.2	0.5
Auto and Travel	0.1	0.3	0.1	0.1
All Other Expenses	<u>0.6</u>	<u>1.2</u>	<u>1.4</u>	<u>1.0</u>
Total	16.8	5.1	4.9	4.0
Overhead Allocation	<u>0.8</u>	<u>1.3</u>	<u>1.9</u>	
Total Internal	17.5	6.4	6.8	
External Adjustment		<u>4.8</u>		
Total Claims Cost		11.2		

Source: IBC. Expense Allocation Program Results, 1985

TABLE 81985 Provincial Expense Ratios

	<u>Agency Acquisit'n</u>	<u>Underwrit'g Policy Process'g</u>	<u>Claims Settlement & Process'g</u>	<u>External Adjustm't</u>	<u>Total</u>
Quebec	17.9	8.6	7.1	4.6	38.3
Ontario	17.5	6.8	6.4	4.8	35.5
Manitoba/ Saskatchewan	21.4	9.1	6.9	2.7	40.1
Alberta	16.8	7.5	6.8	3.8	34.9
Newfoundland	17.6	7.5	6.3	5.5	36.9
P.E.I.	16.6	7.8	5.8	4.9	35.1
Nova Scotia	18.6	8.2	6.1	5.3	38.2
New Brunswick	17.5	7.4	6.4	4.7	36.0
British Columbia	18.0	9.4	5.1	3.2	35.7
Yukon & N.W. Territories	15.1	7.9	5.6	6.4	35.0
Average					36.6
Standard Deviation					1.8

Source: IBC. Expense Allocation Program Results, 1985.

D. Investment Income

The final component of the underwriting results is the allocation of investment income. As the model of Chapter II showed, the correct amount of investment income to allocate to the underwriting results is the product of two factors: the amount of free investment dollars per dollar of premium income (what we previously labelled γ) and the risk-free interest rate. The reason for the former is that every dollar of premium income automatically gives rise to funds which can be invested prior to the final settlement of all claims. The reason for the latter is that in aggregate the return from casualty insurance is largely 'unsystematic' and not priced in security markets. Hence, the funds that are invested prior to the settlement of claims should earn the risk-free interest rate.

This latter treatment of investment income is very important. Implicitly, the argument is that the policyholders are entitled to a return on the use of their funds prior to claims settlement, and that competition amongst insurance companies will ensure that they receive it. The result is to treat casualty insurance companies as investment companies with access to risk-free borrowing from policyholders, with competition forcing them to pay the risk-free rate on this borrowing. In Table 9 we have the aggregate balance sheet data for all Canadian casualty insurers for 1985. This total may include a small amount of non-Canadian business, but this is unlikely to affect the ratios that we are interested in. In order to divide all the amounts into the aggregate totals that are of interest we need to make some assumptions. For our purposes, we include the reserves required by the Federal Superintendent of Insurance's office as common equity. These reserves against non-admitted assets, certain investments and foreign exchange and unregistered reinsurance represent a part of equity that is specifically allocated as a reserve against certain contingencies. However, the funds have still been provided by the stockholders and are invested on their behalf. Similarly, contingency reserves and deferred income taxes are included in equity. As a result, for 1985, 'free' liabilities represented 74.46% of total assets and equity 25.54%.

On the investment side the following accounts are classified as investments: term deposits, bonds, mortgages, loans, preferred shares, common shares, real

TABLE 9Combined Balance Sheet: Canadian Casualty Insurers

\$Millions

Cash*	217.2	Accounts Payable	815.6
Premiums Receivable*	805.0	Unpaid Claims	4,420.8
Due from Subsidiaries*	164.4	Unearned Premiums	2,583.9
Investment Revenue Due	142.7	Unearned Commissions	3.7
Other Receivables*	390.0	Other Policy Premiums	49.7
Term Deposits	801.9	Other Liabilities	82.6
Bonds	4,837.0	<u>Total Liabilities</u>	<u>7,956.3</u>
Mortgage Loans	320.9	Deferred Income Taxes	29.3
Preferred Shares	850.8	Reserves for Non-Admitted	
		Assets	200.0
Common Shares	1,020.5	Reserves for Investments	4.1
Real Estate	343.3	<u>Reserves for Reinsurance</u>	<u>122.8</u>
Other Investments	18.1	<u>Total Reserves</u>	<u>349.2</u>
Investments in			
Subsidiaries*	210.9	Capital Stock	1,083.3
Deferred Policy			
Acquisition*	421.3	Earned Surplus	1,222.9
Other Assets*	140.8	Contingency Reserves	43.9
<hr/>			
Total Assets	10,684.8	Total Liabilities	10,684.8
<hr/>			

Source: Federal Superintendent of Insurance 1985.

*Assumed Insurance Assets

estate, other investments and investment revenue due and accrued. All other accounts are classified as necessary 'insurance' accounts. That is, they are essentially non-interest bearing accounts that are required as a result of doing business as an insurance company. The only controversial account is cash, which is obviously required to function as an insurance company, but also exists for a pure investment company, since 100% full investment in securities is in practice impossible to achieve. Cash in our tables is classified as an insurance account, which in total aggregate to 21.99% of total assets. Since 74.46% of total liabilities are free and 21.99% of those liabilities are invested in non-interest bearing insurance assets, net free liabilities available for investment purposes are 52.47% of total assets.

For 1985 total net premiums earned were \$5,115 million, which means that the 'sales turnover ratio' for the industry as a whole was 0.48, that is, each dollar of assets generated on average 48 cents in net premiums earned. If we divide the net free liability ratio by the sales turnover ratio, we get the net free liabilities per dollar of net premiums earned, which in 1985 was 1.096. This ratio of 1.096 means that on average every net premium dollar earned provided the casualty insurer with \$1.096 in free liabilities that could be invested to earn investment income. The reason for the number being greater than one is that the policy will likely be closed out several years in the future, when all claims will be finally settled.

Table 10 gives the breakdown of the free liability ratio, the net insurance assets ratio, the net free liability ratio, the turnover ratio and the net free liability per dollar of premium earned ratio for Canadian, British and foreign insurance companies for 1981-85. Note that the ratios are significantly different across the different types of insurance companies, mainly because of the differences in the types of insurance written. British insurance companies, for example, are much more heavily exposed to reinsurance and marine insurance, which results in a smaller proportion of insurance assets and as a result, a larger proportion of investment assets. In contrast, Canadian insurers are more exposed to automobile insurance with its higher claims ratio and thus larger proportion of free liabilities (i.e., more reserves for future claims settlement).

TABLE 10Investment Income Results

A. Canadian Companies	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>	<u>1981</u>
Free Liability Ratio(%)	74.5	72.8	71.2	71.7	72.5
Insurance Asset Ratio(%)	22.0	21.2	19.3	22.3	21.9
Net Free Liability Ratio(%)	52.5	51.6	51.9	49.4	50.6
Turnover Ratio	0.48	0.50	0.51	0.53	0.51
Net Free Liability Per Dollar of Premium Earned	1.096	1.031	1.02	0.936	0.989
B. British Companies					
Free Liability Ratio(%)	66.9	66.1	63.9	70.3	73.6
Insurance Asset Ratio(%)	17.0	8.4	9.2	10.5	9.0
Net Free Liability Ratio(%)	49.9	57.6	54.7	59.8	64.5
Turnover Ratio	0.56	0.57	0.59	0.65	0.59
Net Free Liability Per Dollar of Premium Earned	0.896	1.02	0.925	0.915	1.09
C. Foreign Companies					
Free Liability Ratio(%)	61.2	57.9	57.5	57.5	58.9
Insurance Asset Ratio(%)	10.4	9.7	9.81	9.5	9.1
Net Free Liability Ratio(%)	50.8	48.2	47.7	48.0	49.8
Turnover Ratio	0.37	0.37	0.38	0.39	0.35
Net Free Liability Per Dollar of Premium Earned	1.36	1.31	1.24	1.24	1.42

Source: 1985 Federal Superintendent's Report.

The overall 1985 average of the free liabilities per dollar of net premium earned, calculated by using net premiums earned as the weights, is 1.14. This is a reasonable proxy to use for automobile insurance, since reliable balance sheet ratios are not available for any 'pure' automobile insurers. The investment return on these 'free liabilities' is the risk-free rate of interest. Since the liabilities will exist as long as the insurer stays in business, the appropriate rate is the yield on a perpetual Government of Canada bond. Unfortunately, there are no perpetuities issued by the Government of Canada; instead we use the average rate on over 10 year Government of Canada bonds published in the Bank of Canada Review. For 1985 this rate averaged 11.11%, which means that the product of this rate and the net free liabilities per dollar of premium earned, 12.67%, is the investment return which should be allocated to the underwriting results of a tax-free insurance firm for 1985.

This procedure is repeated for each year back to 1981 in Table 11. Note that there are some minor changes in the free liabilities ratio from year to year, as we would expect, since all of the asset and liability accounts will not change equally with net premiums earned. Clearly, however, the 'steady state' is in excess of one. Similarly, the financial markets have been noticeably unstable since the late 1970s, so that the yield on long Canada's has varied quite considerably. As a result, the investment income that should be added to the underwriting results of a tax-free firm varies from a low of 12.06% in 1983 to a high of 16.83% in 1981.

To adjust the above results for a car insurance firm paying corporate income taxes, we use the model developed in equation (17). However, we have no way of estimating the appropriate tax rate to apply to an insurance firm's automobile operations. Therefore, we use the Department of Finance's estimate (Tax Reform 1987: Lower Rates Fairer System, June 18, 1987) for financial institutions and insurance companies of about 15%. Hence in Table 11, row four gives the grossed-up investment income per dollar of NPE ($r\gamma/(1-t)$), row five the tax effect term ($-((1+\gamma\alpha)/\alpha)rt/(1-t)$) and the final row the total investment income contribution for a private insurance firm paying taxes at 15%.

TABLE 11Investment Income to Allocate To Underwriting

	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>	<u>1981</u>
Free Liabilities					
Per Dollar of N.P.E.	1.14	1.10	1.07	1.01	1.10
+10 Year Canada Bonds	11.11	12.74	11.27	14.36	15.03
Investment Income (no tax) Per Dollar of N.P.E. (%)	12.67	14.0	12.06	14.50	16.83
Investment Income (tax) Per Dollar of N.P.E. (%)	14.91	16.47	14.19	17.06	19.8
Tax Effect	<u>-2.89</u>	<u>-3.31</u>	<u>-2.93</u>	<u>-3.73</u>	<u>-3.91</u>
Total	12.02	13.16	11.26	13.33	15.89
	=====	=====	=====	=====	=====

N.P.E. = Net Premiums Earned

E. Overall Results

Sections III(a), III(c) and III(d) have calculated the key ratios needed to analyze the profitability of underwriting since 1981 and Section III(b) the general level of those premiums. In Table 12 we put all of these results together and analyze the profitability of general casualty underwriting for Canadian, British and foreign insurance companies. Again, because of the differing product mixes the claims, expense and free liability ratios will differ across the three subgroups of casualty insurers. Clearly, however, 1985 was a bad underwriting year, since the real profitability was negative for all three subcategories of insurers, ranging from a loss of 7.1 cents per premium dollar for British companies down to 4.6 cents per premium dollar for Canadian companies. However, in earlier years underwriting was mostly profitable. Over the entire five year period average profits were -1.1 cents, 4.2 cents, and 2.3 cents for Canadian, British and foreign insurers respectively.

However, interesting though the overall results are, what is the main interest is the position of the automobile insurers in Ontario. This we can estimate by putting together the previous claims and expense ratios for Ontario automobile insurers with our overall average investment ratio. This data is in the bottom part of Table 12. This shows a dramatically different picture than the previous overall profitability picture, with profits in 1981 of 6.8 cents per premium dollar, declining almost annually to losses of 13 cents per premium dollar in 1985. This data is indicative only of underlying automobile insurance profitability, since as the corporate tax rate increases, this already gloomy picture gets even worse.

Table 12 also allows us to interpret how these losses have developed. In 1981-2 substantial investment income was earned because of high nominal interest rates and the attraction of enhancing investment income by writing more policies. Plausibly, the attractive investment income led to competition for premium dollars that kept policy rates down. However, as rates came under competitive pressure the claims ratio continued to rise, mostly as we have seen due to dramatically higher claims for third party liability for bodily injury and property damage. The "lid came off the pot" with the parallel lowering of nominal interest rates and the consequent decline in the contribution from investment income. This double conjunction of lowering investment income and a rising claims ratio inevitably led to a need to increase premiums. However, it appears that after premiums were cut during the high nominal interest rate period, they were not subsequently increased fast enough to compensate for both the increasing claims ratio and the decline in investment income. Note that throughout this period the expense ratio was reasonably constant and played no role in the competitive squeezing and subsequent expanding of automobile insurance rates.

TABLE 12Underwriting Profitability

<u>Canadian</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>	<u>1981</u>
Claims Ratio	.808	.759	.732	.815	.845
Expense Ratio	.353	.348	.334	.338	.336
Investment Income \$/NPE	.115	.124	.108	.126	.140
Underwriting Results	-.046	.017	.042	-.027	-.004

British

Claims Ratio	.800	.686	.592	.692	.739
Expense Ratio	.358	.338	.355	.356	.370
Investment Income \$/NPE	.093	.122	.098	.123	.156
Underwriting Results	-.071	.073	.141	.064	.003

Foreign

Claims Ratio	.855	.775	.742	.797	.875
Expense Ratio	.344	.316	.317	.332	.314
Investment Income \$/NPE	.145	.159	.133	.170	.204
Underwriting Results	-.054	.038	.074	.041	.015

Automobile Insurance

Claims Ratio	1.007	.952	.839	.805	.845
Expense Ratio	.243	.259	.25	.242	.246
Investment Income \$/NPE	.120	.132	.113	.133	.159
Underwritng Results	-.129	-.079	.024	.086	.068

NOTE: Claims ratio includes all claims adjusting expenses.

Source: Calculated and Federal Superintendent's 1985 report.

APPENDIX: ECONOMIES OF SCALE IN UNDERWRITING

The cost function for a casualty insurer was represented in Section II(A) as

$$C = LP + vP + F \quad A(1)$$

where L and v were the Loss (claims) ratio and variable costs respectively, F the fixed costs and P the net premiums earned. No distinction at that time was made between short and long run costs. Clearly, if $A(1)$ is a short run cost function, then average cost can be represented by dividing $A(1)$ through by P , i.e.

$$C/P = L + v + F/P \quad A(2)$$

in which case average cost decreases with the net premiums earned and marginal cost ($L+v$) is below average cost.

The cost function in $A(1)$ may be representative in the short run, but in the long run even fixed costs are variable. As a result, with the increased net premiums earned, i.e., an increase in scale, firms will tend to increase their fixed costs since they find that they cannot continue to operate at a higher level of business with the same staff, buildings and support equipment.

This is illustrated in figure A1. Initially, the firm may be writing P_1 in policies with average cost $LRAC$ which is the long run average cost. In the short run, the firm may be able to expand operations to P_2 , increasing its short run costs to $SRAC_1$, as it pays overtime wages etc. However, as the strain of operating on limited resources begins to have effect the firm will expand its support staff thus increasing its fixed costs, reducing its variable costs and shifting its short run average cost curve to the right. In our example, we have assumed constant long run average cost, so that the $SRAC$ shifts to the right until it intersects the $LRAC$ at P_2 . The reverse happens if a firm reduces output. Its short run average cost increases to $SRAC_0$, but over time it will slim down and reorganize, thus driving down its fixed costs and shifting the $SRAC$ to the left until it too is producing at the assumed $LRAC$.

The result of this sort of model is that when we observe average costs we will observe long run average

SHORT AND LONG RUN COST BEHAVIOUR

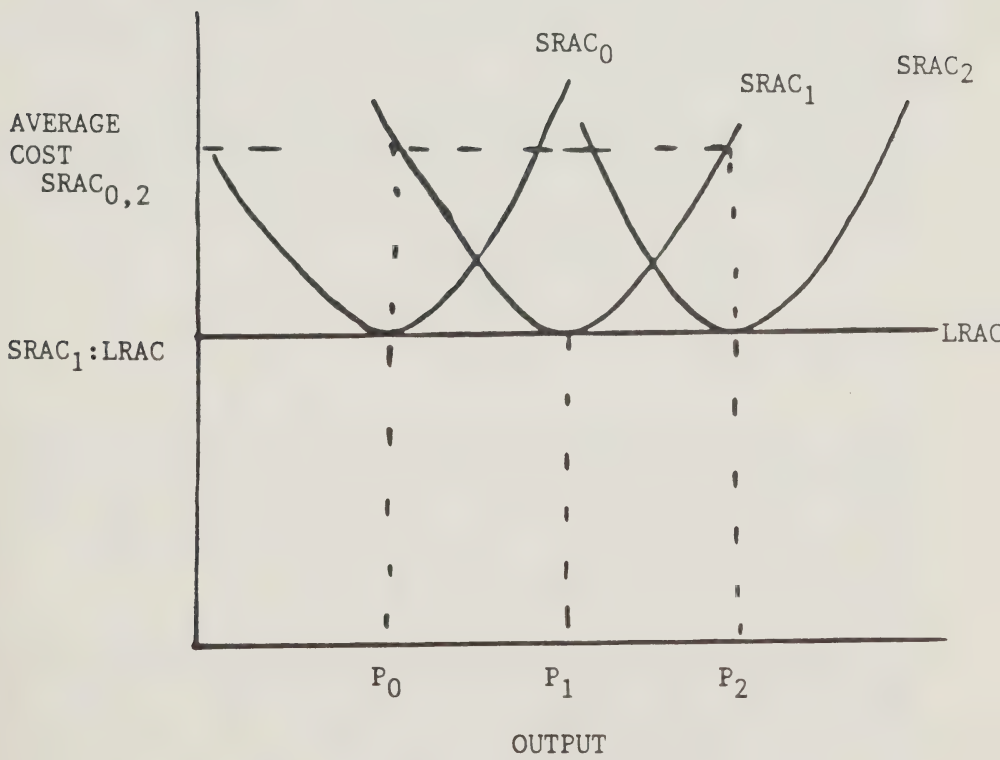


FIGURE A1

cost plus an increase or decrease depending upon whether the firm is expanding or reducing output. If long run average costs are constant, which means constant returns to scale, then we will observe the long run average cost plus random error, and this LRAC will be unrelated to scale.

This gives us a testable hypothesis: is average cost related to scale? In the case of casualty insurance companies it is clear that the claims ratio is independent of scale, what is left is the expense ratio which includes short run variable costs such as commissions and premium taxes and short run fixed costs such as training, office expenditures, support personnel, etc. Since we do not have pure automobile insurance results, we have to use the overall results, which reflect the particular product mix of individual companies.

If we use the 1985 report of the Federal Superintendent of Insurance, we find for the 93 Canadian companies that

$$y = 42.28 - 0.0000485 \text{ NPE} \quad (\text{A1})$$

(26.48) (2.93)

$$R^2 = 7.6\% \quad n = 93$$

where y is the expense ratio and NPE is net premiums earned and the numbers in parentheses are the t statistics. This appears to imply that as the scale increases i.e., higher levels of net premium earned, then the expense ratio declines, since the slope coefficient is negative and significant at the 5% level.

The problem with the above regression results is model mis-specification, since the expense ratio is found as total expenses divided by net premiums earned. Hence, net premiums earned appears as part of the dependent variable as well as the independent variable. That is, the equation is really

$$Y/\text{NPE} = \alpha + \beta \text{ NPE}$$

where Y is now total expenses. Obviously, as NPE increases you could introduce spurious negative correlation into the regression.

An alternative regression is to use total expenses as the dependent variable. The problem is then that the errors are no longer distributed multivariate normal. The larger firms will have greater deviations from the model, a problem known in econometrics as heteroskedasticity. To correct for this, we run the regression $Y = \alpha + \beta \text{NPE}$ by dividing both sides by NPE to get homoskedastic error terms. The results of this regression

$$y = \alpha / \text{NPE} + \beta \quad (\text{A2})$$

are

$$y = 1311.7 \frac{1}{(6.039) (\text{NPE})} + 38.34 \quad (32.27)$$

$$R^2 = 27.8\% \quad n = 93$$

However, there is no reason to believe that the underlying cost function is linear. It could equally be that $y = \alpha + \beta \text{NPE} + \gamma \text{NPE}^2$ indicating that total expenses increase or decrease more than proportionately with scale. If we correct this model for heteroskedasticity we get the results

$$y = 40.475 - 3.81(\text{D-05})\text{NPE} + 1241.3 \frac{1}{(28.89) (-2.669) (5.85) (\text{NPE})} \quad (\text{A3})$$

$$R^2 = 32.37 \quad n = 93$$

which is a better fit than the first model and indicates that the marginal expense ratio is $40.475 - 0.000076\text{NPE}$, which falls with increases in net premiums earned.

The results of these simple tests would indicate the existence of economies of scale. However, we know from the Insurance Bureau of Canada's expense report data that expense ratios differ across different lines of insurance. Hence, the above scale effects could be due to a change in the composition of insurance as a company gets bigger. To test for this a simple regression of the percent of business coming from automobile insurance against NPE was run with the following results

$$\text{Auto \%} = 36.65 + 7.468(\text{D-05})\text{NPE} \quad (\text{A4}) \\ (10.97) (2.157)$$

$$R^2 = 3.85\% \quad n = 93$$

which indicates that larger firms do have a higher proportion of automobile business and thus would tend to have lower expense ratios not because they are bigger, but because they do different kinds of business.

To remove this composition effect, the percentage of automobile business was included as an additional explanatory variable in our A3 regression with the following result

$$y = 46.73 + 1306.1 \frac{1}{(24.54)} - 0.000246NPE - 0.173(Auto \%)$$

(6.755) (NPE) (-1.844) (-4.42)

$$R^2 = 43.9 \quad n = 93$$

Note that the explanatory power improves yet again, but that the NPE term is now barely significant, since it fails the normal two tail significance level of 5%. If we drop NPE as an explanatory variable we get

$$y = 46.02 + 1355.42 \frac{1}{(24.35)} - 0.1897(Auto \%) \quad (A6)$$

(6.981) NPE (-4.91)

$$R^2 = 42.5 \quad n = 93$$

which has basically the same explanatory power as model A5.

In Figure A1, we graph the regression models A3, A5 and A6. The models are labelled A, B and C respectively.

Clearly, the models have different implications for the existence of economies of scale. Model A indicates quite large scale economies, mainly because large firms have more auto business, that in turn results in lower expenses. When this factor is eliminated the scale economies are not so substantial. However, by removing the term involving NPE, although the regression model has almost the same explanatory power, the scale economies disappear.

The overall conclusion from examining this sample of firms is that the tests for scale economies are not conclusive. Given the different sizes of the firms, there is a substantial danger of mis-specifying the model and generating spurious results. When these problems are address-

sed it appears that a model indicating the absence of scale economies has almost the same explanatory power (42.5%) as one that indicates the existence of scale economies (43.9%). Hence, the overall evidence is that the main determinate of expense ratios is the composition of a firm's business rather than the absolute size of the company.

SCALE ECONOMIES

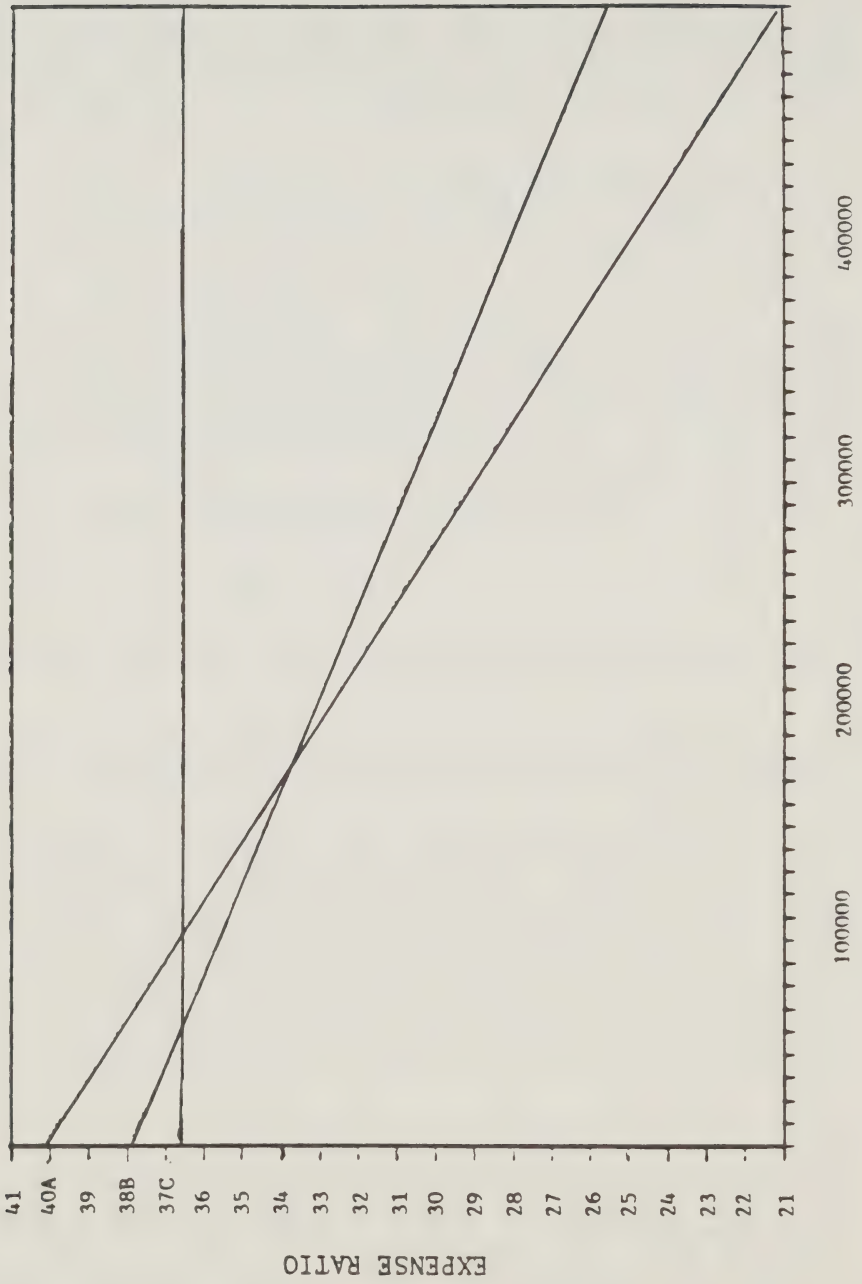


FIGURE A1

IV. PRIVATE SECTOR RATE MAKING

A. Theoretical Background

We have seen in the model developed in Chapter II that the average cost of a premium is $L+v+F/P$, where L and v are the loss ratio and variable cost respectively and F/P is the fixed cost per dollar of net premiums earned. Moreover, by examining general expenses we showed that $v+F/P$ was essentially a constant and independent of the scale of the firm. Since the firm has little control over its investment income, this leaves LP the pure premium, as the crucial competitive variable. However, firms do not compete on the basis of average risk.

Suppose Royal Insurance, for example, decided that average risk warranted an average pure premium of \$300, but that Co-operators could divide risks more accurately into a high risk group that warranted a pure premium of \$400 and a lower risk group that warranted a pure premium of \$200. In this situation, Co-operators would be able to sell car insurance to the low risk group at \$200, but not to the high risk group at \$400. The reason being that once identified by Co-operators as high risk, this group would just go to the Royal and get coverage at \$300, based upon the Royal's average classification of all risks.

Over time, the car insurance market would be allocated to the two firms with the low risk group going to Co-operators at \$200 and being charged according to their risk, and the high risk group going to the Royal where they would be getting bargain insurance. Co-operators would be financially viable, since on average it is pricing its insurance fairly relative to its claims costs. However, the Royal would lose money since it is pricing on the basis of an average risk car insurance portfolio that in fact consists of all the high risks, since all the low risks have gone to Co-operators.

This example illustrates a fundamental tenet of a competitive industry: cross-subsidization of expensive services by charging more for cheaper services cannot survive. The firm that cross-subsidizes will lose all of its 'cheap' business, since it is overcharging its customers, and they will go elsewhere. The principle is as true for car insurance as it is for telecommunications, where the CRTC refused to allow CNCP to compete for Bell Canada's

long-distance business on the grounds that competition would lower rates causing Bell Canada to lose the revenues required to subsidize local telephone service.

Once we recognize the competitive reasons for defining risks as accurately as possible, we can understand why no private car insurance company can offer an average rate for an average risk to enforce cross-subsidization. It also explains why the rate structure for private firms is so complex and why only public monopoly car insurers can have a simple rate structure that embodies cross-subsidization. Conversely, it also explains why public car insurers will not allow private competition, since in these circumstances the private insurers, like Co-operators in our example, will 'cream the market' and only take the good risks leaving the public insurer, like the Royal in our previous example, with all the bad risks.

B. Pure Premium Classes (loss costs)

Having established the reasons for the complex system of rate classification, it remains to look at the actual structure of pure premiums according to existing industry practice. Here, it is important to point out that all we can do is look at existing classes, since information is only available for those classes. The information gathered according to the new statistical plan, starting in January 1985, is not yet available and more years of experience are required before valid inferences can be made from the data.

The highest aggregated pure premium is the Canada-wide data (excluding the public plans) already discussed in Section II.6. There we pointed out that for 1985 the pure premium for passenger cars for Ontario was \$442.06 for an 'average' policy in 1986, whereas for the rest of Canada it was only \$278.49. Clearly, here we have a basis for differentiating rates. Each policy written in Ontario will have, on average, a higher claims cost of \$164. Hence, private insurance companies have to differentiate rates across provinces, otherwise pure Newfoundland car insurance companies could undercut national insurance company rates that were pricing on the basis of an average national risk.

Drawing a difference between the treatment of things or people (Websters) or discrimination seems acceptable on

the basis of province. It would be nice (since I live in Ontario) if in the interests of national unity the Federal government could create one monopoly public car insurance company to price on the basis of average risk. This cross-subsidization of poor risks by good risks would benefit, as we will see, even good risks who happen to live in Ontario in general and Toronto in particular. However, such a national monopoly is impracticable, partly because the provincial differences are themselves partly caused by differences in provincial regulations (payouts for third party liability, etc.).

The geographical differences across provinces also show up within provinces. Table 13 gives the pure premiums for private passenger cars for Toronto and Northwestern Ontario, a region that includes Kenora (as well as Thunder Bay) as well as Ontario as a whole. For 1986 the actual loss cost per car insured, or pure premium, was \$560.04 in Toronto versus only \$293.02 in the Kenora region, a difference of \$267.02, and over the five year period the Toronto region consistently has the highest pure premium by a wide margin, except for 1983 when the loss cost for third party liability was unusually high.

This last observation should remind us again that the pure premiums are actual losses, not expected losses. Hence, as we divide up the rate classification the variability in the pure premium will increase as the number of cars insured falls. For example, in Toronto 1,260,680 cars were insured for 1986 (the Green Book uses 'car years') versus only 43,433 for the Kenora region. As a result, a particularly expensive accident will have more impact on the Kenora figures than the Toronto figures. However, when setting rates these differences would be adjusted for.

The implication of the data in Table 13 is that there is substantial regional variation in pure premiums within Ontario. Car insurance rates set by private companies will reflect these differences in expected claims costs. Hence, even though it would be difficult to create a national public monopoly to cross-subsidize high risk drivers, it would be possible to create an Ontario public insurance monopoly. This monopoly might wish to treat all Ontario drivers 'fairly' and not discriminate against those drivers that happen to live in Toronto. In this case, drivers in Kenora would be subsidizing drivers in

TABLE 13Toronto VS. Kenora Pure Premiums**

	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>
TORONTO					
Third Party*	372.48	340.00	299.03	258.18	223.20
Accident Benefits	46.05	40.50	36.06	29.35	27.09
Collision	<u>141.51</u>	<u>130.85</u>	<u>113.35</u>	<u>101.09</u>	<u>109.07</u>
Total	560.04	511.35	448.44	388.62	359.36
	=====	=====	=====	=====	=====
KENORA					
Third Party*	148.21	162.64	143.13	206.90	124.86
Accident Benefits	22.29	14.78	16.77	22.65	16.78
Collision	<u>122.52</u>	<u>124.99</u>	<u>116.59</u>	<u>106.25</u>	<u>107.48</u>
Total	293.02	302.41	273.49	335.8	249.12
	=====	=====	=====	=====	=====
ONTARIO					
Third Party*	292.67	273.57	236.76	203.29	182.49
Accident Benefits	32.89	29.69	26.02	23.00	21.11
Collision	<u>117.76</u>	<u>111.05</u>	<u>99.17</u>	<u>89.07</u>	<u>93.56</u>
Total	443.32	414.31	361.95	315.36	297.16
	=====	=====	=====	=====	=====

*Third Party Liability for Bodily Injury and Property Damage (BIPD).

**Private passenger cars excluding farmers.

Toronto to the tune of \$116.72 per car, if all other costs were constant and the 1986 loss costs were taken as indicative of expected costs. Why anybody would want to enforce this cross-subsidization is difficult to determine, given the relative income levels in Kenora and Toronto.

Geographic data unfortunately does not allow further refinement because of the lack of sufficient numbers in each region for each subgroup. Hence, the additional subgroups examined are all for Canada-wide classifications. From the differences between Kenora and Toronto, however, it should be apparent that traffic density as reflected in the number of cars on a particular mile of road is an important factor in determining loss costs. This distinction at its broadest is an urban/rural distinction.

In Table 14 we have the Canada-wide figures for urban rural loss costs. Clearly, loss costs are lower in rural areas than urban areas. Plausibly, again, a private company could cross-subsidize urban drivers by forcing rural areas to pay higher premiums than are justified by the expected loss costs. However, this merely provides the incentive to set up a 'rural co-operative' to insure its members. Indeed, for 1986 the loss cost for Ontario farmers' private passenger vehicles was only \$253.00, which was considerably lower than the Ontario average in Table 7 of \$443.32, which excluded farmers. This difference provided some of the justification for the existence of farmers' mutual insurance companies.

By now the picture should be clear. Car insurance companies will continue to discriminate between drivers as long as the difference in expected loss costs justifies a further subdivision of the rate class, and the insurers believe that the difference is statistically significant. Otherwise, the insurance company will lose better risks to companies that can refine their rate classification. The implication of this is that the complex rate structure is indicative of a competitive industry, just as the simple structure of ICBC, MPIC and SGI is indicative of a cross-subsidizing public monopoly. Where the discrimination in any rate classification becomes unethical is a moral question. Clearly, any private car insurance company has to currently discriminate between Ontario and elsewhere in Canada, Toronto and Kenora, farmer and non-farmer and urban and rural. Otherwise, they would quickly become unprofitable and be forced out of business. Moreover, we can get into even more refinements of the rate structure.

TABLE 14Urban-Rural Pure Premiums

	URBAN				
	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>
Third Party*	285.18	261.81	223.99	199.50	109.32
Accident Benefits	25.93	23.43	30.78	18.35	16.74
Collision	<u>120.06</u>	<u>111.61</u>	<u>100.20</u>	<u>92.39</u>	<u>86.29</u>
	431.17	296.84	344.97	310.25	212.36
	=====	=====	=====	=====	=====
	RURAL				
	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>
Third Party*	188.37	172.38	145.19	133.31	128.02
Accident Benefits	25.93	23.43	20.78	18.35	16.74
Collision	<u>106.43</u>	<u>99.64</u>	<u>92.80</u>	<u>89.22</u>	<u>95.81</u>
	320.73	295.45	258.76	240.88	240.57
	=====	=====	=====	=====	=====

*Third Party Liability for Bodily Injury and Property Damage (BIPD).

In Table 15 is the country-wide urban driving population divided up into five claims-free classifications ranging from zero years claims-free driving to over five years claims-free driving. Unfortunately, the accident benefits average loss cost cannot be so divided up, but assuming the same average cost, we get 1986 average loss costs of \$386.89 for five years and over claims-free driving to \$802.30 for someone with no years of claims-free driving.

TABLE 15

Years of Claims-Free Driving and Pure Premiums
Urban Private Passenger Cars Excluding Farmers

	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>
BIPD					
5 years	249.36	231.31	198.39	172.64	96.35
3 years	408.21	468.77	341.24	302.25	165.96
2 years	414.24	409.33	338.08	336.49	254.06
1 year	595.22	393.30	365.75	312.95	176.68
0 year	572.87	572.31	438.42	363.90	313.36
COLLISION					
5 years	111.60	105.17	92.68	85.04	78.16
3 years	177.50	160.81	141.28	131.62	133.75
2 years	146.01	146.22	126.39	121.70	152.42
1 year	153.89	146.16	131.98	117.34	198.00
0 year	203.51	122.36	173.37	124.91	152.56
ACC. BEN.	25.93	23.43	20.78	18.35	16.74
TOTALS					
5 years	386.89	359.91	311.85	276.03	191.24
3 years	611.64	653.01	503.30	452.21	316.45
2 years	586.18	578.98	485.25	476.53	423.22
1 year	775.04	562.89	518.50	448.64	391.42
0 year	802.30	718.10	632.57	507.16	482.66

There are several important implications of this classification structure. Note that quite frequently there is not a nice smooth increase in claims cost as the number of years of claims-free driving declines. For

example, the over three years of claims-free driving has a higher loss cost for collision than the one and two years claims-free driving for every year from 1983-1986. The reason for this is that the numbers involved in this classification are relatively small. Fully, 84.6% of all the drivers (private passenger vehicles excluding Quebec and farmers) have over five years of BIPD claims-free driving. Only 10.45% have three and over, 1.55% two, 1.75% one and 1.68% zero years of claims-free driving.

Hence, when we are trying to refine the overall rate classification for this claim, which has an average loss cost of \$431.16 (slightly different from the country-wide since it excludes Quebec) we can offer rates that would incorporate a \$44.27 reduction for the 84.6% of the population who have over five years of claims-free driving, at the expense of a \$271.4 increase for the 15.4% with less than five years of claims-free driving. The problem is that the high risk drivers who have such high loss costs are such a small proportion of the overall driving population. Hence, when they are extracted from the driving population, even though their loss costs are almost double the average, the gain for the rest of the driving population is relatively small (10%).

This general problem is also seen in the further rate classification subdivision where we move more directly to discrimination partly based on age, sex and marital status along with years of claims-free driving. The general sub-classifications are listed in Table 16, but note that some of the actual loss cost experience is anomalous, mainly because of the relative size of the numbers in each group. For example, in 1980 there were only 948 unmarried males with no years of claims-free driving in the 23-24 age group. This makes some of this data less reliable than the loss costs for class 01 with five years of claims free driving that had 1,278,448 drivers outside of Quebec excluding farmers.

TABLE 16Private Passenger Classification Descriptions

<u>CLASS</u>	<u>DESCRIPTION</u>
<u>Principal Operator over 25, No Male Under 25, No Female Under 25 Without Driver Training</u>	
01	Pleasure only, driving less than 16,000 km., two or fewer drivers all with a licence held for over three years.
02	Driving to work less than 16 km., two or fewer operators.
03	Over 16 km., driving to work, unmarried female occasional driver. Principal operator over 25.

Pleasure and Commute Or Business

06	Occasional male driver under 25.
07	Business use, no male driver under 25.

Principal Operator Under 25

08	20 and under married male.
09	21-24 married male.
10	under 18 unmarried male.
11	19-20 unmarried male.
12	21-22 unmarried male.
13	23-24 unmarried male.

Females - Married or Unmarried

18	20 and under.
19	21-24.

Source: 1986 Green Book, pp. 120-121 abridged.

In examining Table 17 note that the good risks have been further refined. Whereas classifying solely on the number of years of claims-free driving resulted in the over five years class having a loss cost of \$386.89, now within that class we find that those in class 01, i.e., pleasure drivers with no one under 25 driving, have a loss cost of \$313.79. Hence, a private insurer can offer a premium reduction to those drivers and still be profitable: conversely, within the one year claims-free driving class, married males as principal operators who were under 20 had a 1986 loss cost of \$3054.81. This number looks questionable when compared with class 08 drivers having five or more years of claims-free driving and the fact that there were only 69 cars insured in this class by private insurers in the whole of Canada, excluding Quebec. However, quite clearly classes 08-13, the young male driver classes had higher loss costs across the board than pleasure drivers in class 01.

The female young drivers in classes 18 and 19 have similarly poor loss cost experience. However, females between 21 and 24 had lower loss costs than their married or single male counterparts, except for the one year claims-free driving category. Hence, private insurers would offer a premium discount to females in their young driver category if they felt the actual loss costs were indicative of expected loss costs. In other words, discrimination based upon sex for young drivers seems to make sense and will inevitably be practised by any competitive car insurance company.

In Figure 8 we have a decision tree that shows some of the major refinements in discriminating between good and bad risks and the 1986 loss costs that were attached to each risk. Clearly, within each class the 1986 loss costs vary quite dramatically. Although the 1986 loss costs may not be indicative of true expected costs for those classes with relatively few cars insured, pooling over a number of years indicates that rate discrimination based upon age and then a further subdivision among the young drivers based upon sex and marital status is justified by experienced loss costs.

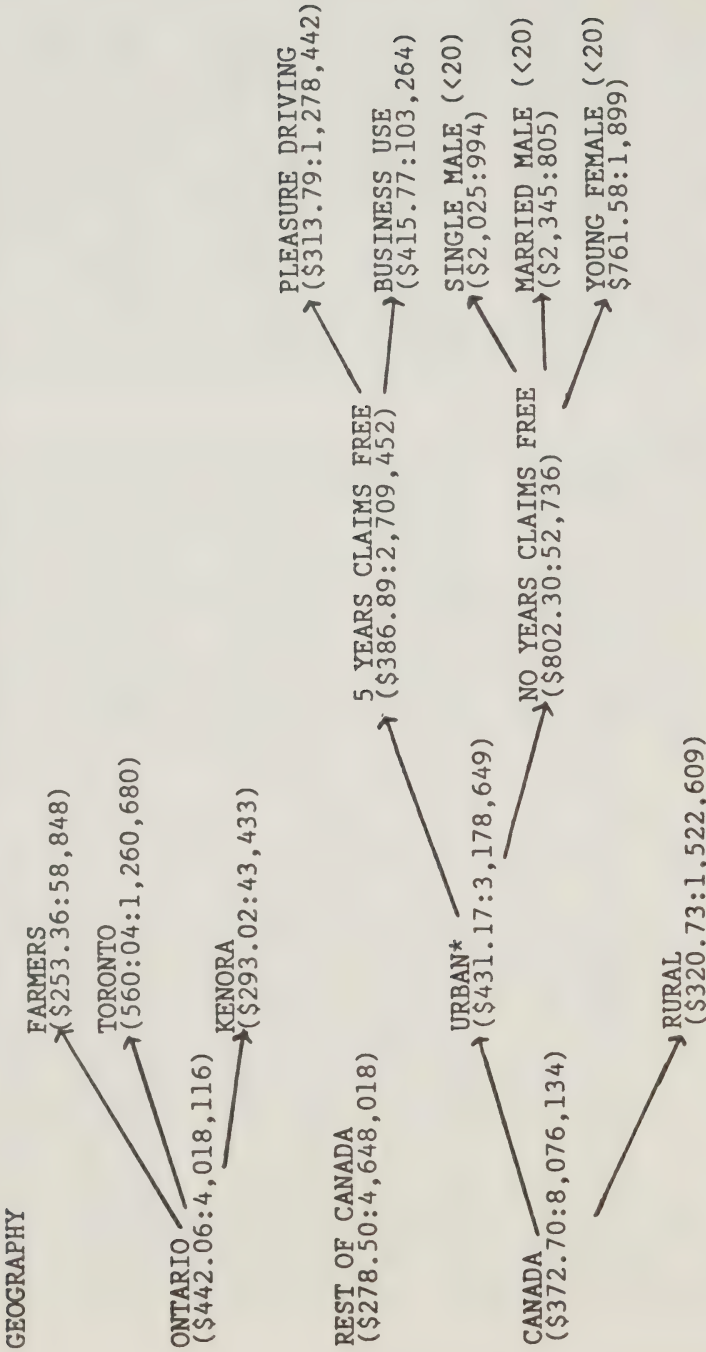
It is always a difficult problem for individuals to signal that they do not belong to a particular class. It is perfectly reasonable to believe that some under 18 year olds with no claims-free driving experience are not the

TABLE 17Major Rate Classification Subgroups: Pure Premiums

<u>Class</u>	<u>5 Years</u>	<u>3 Years</u>	<u>2 Years</u>	<u>1 Year</u>	<u>0 Year</u>
<u>BIPD</u>					
01	199.94	387.22	356.34	363.89	510.07
02	233.02	426.95	388.88	483.81	491.42
03	251.68	376.78	310.93	274.87	678.17
06	224.00	111.15	120.92	171.19	194.73
07	244.81	456.15	381.20	308.57	614.12
08	1135.12	768.83	435.99	2027.78	1136.57
09	334.08	618.97	564.15	574.20	543.49
10	782.83	823.97	775.35	1325.02	1083.92
11	505.40	737.62	797.13	1375.12	1526.07
12	485.73	657.79	492.14	1042.78	815.28
13	408.54	608.93	1018.03	651.14	841.56
18	337.93	467.12	483.12	557.70	470.34
19	273.31	421.50	471.53	945.31	467.26
<u>COLLISION</u>					
01	90.47	156.30	116.70	125.81	130.50
02	101.33	172.84	155.04	169.77	166.44
03	117.42	169.19	141.68	157.22	219.14
06	79.09	41.76	51.89	71.92	120.00
07	147.58	219.52	183.98	187.21	215.89
08	187.66	300.72	307.85	1003.66	1185.21
09	160.38	247.25	268.75	297.39	205.79
10	292.02	420.82	419.08	490.06	448.85
11	306.98	330.16	391.30	399.07	475.71
12	238.17	333.52	327.29	319.85	319.21
13	205.24	273.85	311.16	263.63	232.68
18	186.96	213.06	198.79	263.47	267.86
19	143.62	189.70	189.51	205.82	173.54
<u>ACC. BEN.</u>	23.38				
<u>TOTALS</u>					
01	313.79	566.90	496.42	513.08	663.96
02	357.73	623.17	567.30	676.96	681.24
03	392.48	569.35	476.00	455.47	920.70
06	326.47	176.29	196.19	266.49	338.11
07	415.77	699.05	588.56	519.16	853.39
08	1346.16	1092.93	767.22	3054.81	2345.16
09	517.84	889.60	856.28	894.97	772.66
10	1098.23	1268.17	1217.81	1838.45	1556.15
11	835.76	1091.17	1211.80	1797.57	2025.16
12	747.27	1014.69	842.81	1386.01	1157.86
13	637.16	906.16	1352.57	938.14	1097.62
18	548.27	703.56	705.29	844.45	761.58
19	440.31	634.58	684.42	1174.51	664.18

FIGURE 8

Experience Classifications with Size ** and 1986 Loss Costs



* All urban subdivisions are for private passenger cars excluding Quebec & farmers. All others include Quebec, but exclude farmers except where specified.

** Size is based on cars insured for bodily injury and property damage (third party liability).

same bad risk as the average for that class. In the same way, some pleasure drivers with five years claims-free driving experience have just been extraordinarily lucky and really represent poorer risks. However, without any other signalling mechanism to indicate that one under 18 year old male driver is different from another, all have to be lumped together. The class as a whole is very expensive to insure.

In Table 18 is the composition of the loss costs for under 18 year old single males with no claims-free driving and pleasure drivers over 25 with five years claims-free driving who drive less than 16,000 km. per year. Note that the frequency of claims is much higher for the under 18 year olds. Overall, almost one in four cars insured in class 10 have a claim each year for bodily injury and property damage and collision. Indeed, in 1984 half of all cars insured in class 100 had a collision claim. In contrast, in class 015 only one in twenty had a claim for liability (BIPD) and one in fourteen for collision. Obviously, under 18 year old single males are accident prone. Similarly, in 1986 the average claim cost in class 100 was \$5,880 for liability (BIPD) and \$1,505 for collision, whereas for class 015 drivers it was only \$4,331 and \$1,416 respectively. Hence, not only are under 18 year old single males accident prone, but they also have more expensive accidents.

TABLE 18Composition of Loss Costs For Two Polar Classifications

<u>Liability (BIPD)</u>	<u>Claims Frequency</u>	<u>Average Cost</u>	<u>Loss Cost/ Pure Premium</u>
Class 100:	Under 18 years old, single males with no claims-free driving		
1984	0.2067	4,648	960.74
1985	0.2520	3,319	836.38
1986	0.2393	5,888	1407.10

Class 015:	Pleasure only, under 16,000 km., no under 25s		
1984	0.0523	3,388	177.19
1985	0.0541	3,790	205.04
1986	0.0497	4,331	215.20

Collision

Class 100:			
1984	0.52	1,082	1250.00
1985	0.1687	1,463	370.63
1986	0.2034	1,505	445.24

Class 015:			
1984	0.0703	1,154	81.13
1985	0.0740	1,243	91.98
1986	0.0684	1,416	96.99

Collision includes all deductibles except \$25 and \$50.

C. U.S. Experience

In some of the Canadian classes there is insufficient data to be really confident that the loss costs reflect expected costs. In contrast, in the United States pooled data over 44 states for the most recent years (some ending December 1984, others June 1985) is available in Table 19. Note that this data is not comparable to Canadian data on an absolute basis, since it represents 'all coverages combined' where the individual coverages differ as well as their composition in the total. Moreover, the actual classifications also differ. However, within the overall level of rates the relative pure premiums are interesting.

TABLE 19

1985 U.S. Pure Premiums; All Coverages Combined

<u>Classification</u>	<u>Territory I</u>	<u>Territory II</u>
	\$U.S.	
Unmarried Female		
21-24, drive to work (8971)	306.35	426.43
Unmarried Male		
21-24, drive to work (8821)	392.06	509.51
Married Male		
21-24, drive to work (8421)	324.01	464.59
All Other Adults		
drive to work (8131)	222.42	289.56
Pleasure Only (8111)	193.39	298.21

Territory II includes major urban areas, such as Los Angeles, Philadelphia, Chicago, New York, etc.

Source: Circular, October 29, 1986: Insurance Services Office (U.S.).

Note that in both the low and high risk territories (less urban) unmarried males again have a higher loss cost than unmarried females in the 18-21 young driver class. This extra loss cost is around \$85 or 20% of the unmarried females' loss cost. Similarly, unmarried 21-24 year old males now have an extra loss cost of \$45.70 over their unmarried brethren or a premium of 10-20%. For all other adults (over 25) who are in the same 'drive to work' category the average loss cost is only U.S. \$222.42-U.S.\$289.56 depending on the territory, which gives an extra loss cost to the unmarried male of \$170-\$220 or about 76%. The lowest loss cost class is again the pleasure only driver.

U.S. data, which includes vastly more observations, thus supports the Canadian data that discrimination on the basis of age, sex and marital status does in fact produce a significant refinement in the estimation of expected loss costs per insured vehicle. As in Canada, data in the U.S. is also collected using additional geographical classifications due to the higher loss cost experience in more urban driving environments.

E. Setting Rates

Sections III(B) and (C) have dwelt at length with pure premiums or actual loss costs, since it is a fundamental tenet of insurance, as described in Section III(A), that better estimation of exposure means keener pricing. Moreover, this keener pricing in a competitive environment means that firms can survive. A company that charges average prices (premium rates) based on average risks will end up with bad risks, for which it is only charging average prices. Such a policy is a recipe for failure and it is hardly surprising that in a business as competitive as car insurance no private car insurer sets prices on such a basis.

The pure premium in Section III(B) enables insurers to examine the actual experience of claims frequency, settlement costs and pure premiums within different categories. This experience is important, but is not by itself a rating system. How any individual company sets rates is up to that company. Some may decide to use a multiplicative system, whereby surcharges are applied over a base rate based on a percentage, whereas others may charge a surcharge as a fixed amount.

Similarly, as a company finds that it is getting too much business in one area and not enough in another, it will impose an additional surcharge in the one area and offer a discount in another. As a result, although advisory services advise on rates using standardized formulas, actual rates charged vary, sometimes quite dramatically, from one company to another. As in all areas of a private enterprise economy, it pays for the consumer to shop around for bargain rates.

This paper will not show how a rate is determined because practice differs from company to company and in all cases it will involve judgment, both as to how future loss experience is likely to deviate from past experience and whether or not past experience actually measures past risk. In general, however, there are some key principles involved in setting rates:

- each class should be homogeneous, that is, each risk in a class should be as similar as possible;
- each rating criteria should contribute to identifying the expected loss;
- the rating structure should be complete, so that all risks can be assignable;
- each criteria should be clearly defined and verifiable;
- the process should be cheap to administer (i.e., cost effective); and
- the system should be capable of being evaluated, i.e., you have to know whether it's doing what it's supposed to do.

The categories used by the Insurance Bureau of Canada generally fulfill these criteria, since age, sex, marital status, geographic location and occupation (farmer or not) all represent clearly defined, identifying data that is cheap to collect and verify. Some may question driving habits, i.e., whether someone drives to work and if so how far, on the ground that individuals can lie and not be detected. However, by and large the existing rate structure meets the key principles just mentioned.

This is not to say that the existing rate structure is ideal. It may in fact be the case that the young male drivers that have accidents are 'immature' and a mature young driver should not be penalized as a result. The problem is that maturity cannot be measured or verified. It may be possible to solicit references that attest to maturity and impose restrictions on driving habits that might lead to a higher probability of accidents. However, the cost of verifying the references and enforcing some controls over driving, apart from leading to allegations of 'snooping', would be relatively expensive.

The ultimate request of those demanding the removal of the existing rate structure must be that they suggest an alternative structure that meets the key principles outlined above and achieves the same degree of risk refinement. In this regard it has to be noted that the new rating system proposed by the Insurance Bureau of Canada in its submission to the Osborne Commission as yet does not have any experience support. Unless legislation makes some of the previous rating classifications illegal, it will still be the case that a new company can undercut companies using the IBC rating classification in some categories. For example, a 40 year old male pleasure driver with no driving experience may still be a much better risk than an 18 year old in similar circumstances. Although the number of years of licence is obviously meant as a proxy for age it may not be a perfect proxy.

V. THE PUBLIC PLANS

A. Evaluation of Overall Performance

Evaluating the Insurance Corporation of British Columbia (ICBC), the Manitoba Public Insurance Corporation (MPIC) and Saskatchewan Government Insurance (SGI) would be easier if they provided the wealth of detail available for the private car insurance companies operating in the rest of Canada. Unfortunately, since they are not required to file information with the Federal Superintendent of Insurance and they do not provide statistical experience data to the Insurance Bureau of Canada, there is little comparable data available. All that is available is the sketchy data contained in their annual reports which, like most annual reports, consists mainly of a self-congratulatory commentary. Hence, in the analysis that follows, vital pieces of data that permit valid comparisons are missing.

Also, conceptually, the public plans cannot be evaluated on the same basis as private sector companies, since they do not operate under the same set of constraints. Even the public sector plans themselves are not identical with ICBC operating on quite similar lines to a private corporation and SGI-Autofund operating in a manner impossible for any private sector firm. A potted history of the three main public plans is at Appendix A and specific details will be developed as we proceed. However, an overview is provided in the loss costs in Table 20.

For the public plans the loss costs are simply the total claims costs inclusive of adjustment costs divided by the number of insured motor vehicles, except for Saskatchewan where, because of the absence of reported data, indirect estimates had to be made. These overall average costs are compared with the loss costs taken from the 1986 Green Book for passenger cars excluding farmers. Conceptually, these numbers cannot be compared, since within the overall classifications loss costs for private passenger cars will not equal overall vehicle loss costs. Moreover, the average built up from the Green Book, including BIPD, accident benefits and collision will not equal the average for the three public plans, since the basic coverage will differ. For example, the public plans usually cover all perils, not collision. However, given the available data this is the best that can be done.

TABLE 20Loss Costs

	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>
Saskatchewan	N/A	227.49	188.81	182.36
British Columbia	388.11	359.21	365.15	350.00
Manitoba	332.15	279.37	261.86	255.92
Urban	431.17	396.84	344.97	310.25
Rural	320.73	295.45	258.76	240.88
Ontario	443.32	414.31	361.95	315.36
Kenora	293.02	302.41	273.49	335.8
Toronto	560.04	511.35	448.44	388.62
Ontario Farmers	253.0	240.66	203.77	254.74

What is apparent from Table 20 is that the loss cost variability evident over different regions outside of the public plans is consistent with the variability within the plans. For example, Ontario farmers had a 1985 loss cost of \$240.66; this is consistent with the level of loss costs for Saskatchewan in 1985, which was \$227.99. Although coverage in Saskatchewan would also include non-farmers, overall it would be closest to Ontario farmers or the Canada-wide rural classification, which averages only about 35% more.

Similarly, the differences between Ontario and British Columbia are quite persistent but really not that large. Ontario, over the four years 1983-86, averages about 5% more than B.C. Given the regional differences in loss cost shown in Table 20, the differences that exist within Ontario, for example, between Kenora and Toronto, and the fact that the Ontario figure excludes the lower loss costs relevant for Ontario farmers, this 5% difference may not be meaningful. However, it should be pointed out that this premium of Ontario over B.C. is due mainly to the 1986 and 1985 experience, and the trend in loss costs between B.C. and Ontario over time seem to be different.

Overall, the loss costs in Table 13 indicate that if SGI, MPIC and ICBC reported these loss costs for private passenger cars excluding farmers, private car insurers would not be surprised. That is, even though the B.C. loss costs are lower than those in Ontario, and SGI's are about the same as those for Ontario farmers, this variation can be explained by the existing variation based on

different regional and urban/rural mixes. The conclusion from this is that there is no strong evidence from the average loss cost per car insured that would indicate gross inefficiency, or conversely, tremendous efficiency on the part of the public insurance plans.

The loss cost data in Table 20 indicates that the primary cost for car insurance rates within a province, which is the average amount paid out on a claim inclusive of adjusting costs, can essentially be explained by the known pattern of regional variation based on urban/rural and farmer/non-farmer patterns. It does not, of course, indicate what the insurance companies charge for this coverage.

Table 21 gives claims ratios and expense ratios for the three public plans, the Ontario aggregate data up to 1985 and the results for five mainly auto insurers, with the specific company data in Table 22. The average claims ratio in the public sector was 95.9%, with SGI: 87.2%, MPIC: 99.5%, ICBC: 101%. Ontario's claims ratio averaged 90.1% with the five mainly auto insurers at 83.3%. Note that as shown in Figure 1, we would expect the Ontario claims ratio to be higher than the national average given the recent behaviour of the claims ratio for third party liability. This explains why the five national car insurers have a claims ratio below the Ontario average. Also note that, as expected, the claims ratios for the private sector firms are lower than those for the public sector plans because of the effect of the corporate income tax discussed in Chapter II.

The interpretation of the data is quite straightforward, as in the private sector all the public plans have experienced an increasing claims ratio, with ICBC being something of an anomaly having a claims ratio hovering around one, except for 1986. The higher level of the claims ratio for the public plans indicates that the previous data on actual loss costs understates the difference in average premium costs across the provinces. Average premium rates can be approximated by dividing the loss costs in Table 20 by the claims ratios in Table 21. The average premium levels are SGI: \$228.63, MPIC: \$274.76, ICBC: \$361.7 and Ontario: \$389.16, which excludes the 1986 results. Again these results are not surprising given previous data on regional, urban/rural, farmer/non-farmer

TABLE 21Claims and Expense Ratios

	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>
<u>SGI</u>					
Claims Ratio	-	0.992	0.794	0.828	0.874
Expense Ratio	-	0.151	0.110	0.108	0.149
<u>MPIC</u>					
Claims Ratio	1.137	1.016	0.942	0.953	0.925
Expense Ratio	0.121	0.114	0.118	0.127	0.119
<u>ICBC</u>					
Claims Ratio	1.072	0.968	1.012	0.992	1.02
Expense Ratio	0.152	0.146	0.154	0.149	0.146
<u>ONTARIO</u>					
Claims Ratio	N/A	1.007	0.952	0.839	0.805
Expense Ratio	N/A	0.243	0.259	0.25	0.242
<u>REPRESENTATIVE PRIVATE FIRMS*</u>					
Claims Ratio	0.905	0.956	0.830	0.727	0.747
Expense Ratio	0.258	0.274	0.276	0.257	0.269

*As in Table 22.

TABLE 22Representative Car Insurers

	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>
Allstate of Canada (70.0% Auto:\$188.6M)					
Claims	1.022	.952	.831	.703	.716
Expense	.276	.295	.283	.280	.286
Home Insurance (84.1% Auto:\$81.2M)					
Claims	0.872	0.924	0.841	0.771	0.763
Expense	0.301	0.286	0.299	0.306	0.292
Liberty Mutual (83% Auto:\$83.5M)					
Claims	0.961	1.002	0.790	0.793	1.063
Expense	0.255	0.307	0.314	0.289	0.302
State Farm Auto (80% Auto:\$217.0M)					
Claims	0.885	1.058	0.892	0.707	0.712
Expense	0.214	0.243	0.245	0.225	0.202
Pilot Insurance (74% Auto:\$130.0M)					
Claims	0.754	0.786	0.747	0.724	0.638
Expense	0.284	0.268	0.281	0.278	0.323
Average*					
Claims	0.905	0.956	0.830	0.727	0.747
Expense	0.258	0.274	0.276	0.257	0.269

*Weighted by 1986 net premiums earned auto.

differences. Although, the difference between Ontario and ICBC is understated because of the lack of 1986 results for Ontario.

The other interesting data in Table 21 is the difference in expense ratios across the public and private plans. As discussed in Section IIc we would expect the private firms to have higher than average expense ratios because none are 100% car insurance companies and Table 6 has indicated that expense ratios are higher in other lines of insurance. Hence, their average expense ratio of 26.6% is predictably higher than the Ontario average. What requires further explanation is why ICBC's expense ratio averages 15%, SGI's 13% and MPIC's 12%. Taken at face value the expense ratios would seem to be at least 10% lower than the Ontario average.

However, before examining the expense ratio differences we should examine the overall results. We have already looked at loss costs and average premiums, what we now have to do is look at whether or not the underwriting area as a whole is sound in both the public and private sectors. This requires examining investment income.

Table 23 includes the same analysis of the public sector plans as Table 10 for the private companies. First, free liabilities as a percent of assets is calculated. Note here that all of the public plans have very high free liability ratios. This is the corollary of the absence of explicit equity capital, for example, ICBC operates with 'reserves' averaging only 4%, MPIC 14.1% and SGI 13.8%. The reserves ratios themselves are relatively meaningless so long as the provincial governments guarantee the plans, in the sense that they will inject capital should catastrophic losses be incurred. We will return to this later. Second is the insurance asset ratio, that is an estimate of the assets that can be specifically identified as belonging to the insurance operation rather than being straight investments. Third is the net free liability ratio which is the difference between the first two. Finally, the turnover ratio is divided into the net free liability ratio to get the net free liabilities per dollar of net premiums earned.

In comparing the public plans with the private sector in Table 8, note that the end result is very similar, except for ICBC. Both MPIC and SGI average around 90

TABLE 23Investment Funds in Public Plans

	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>
<u>A SGI - Autofund**</u>					
Free Liability Ratio		84.1	77.5	87.1	96.9
Insurance Asset Ratio*		16.0	16.0	30.2	31.0
Net Free Liability Ratio		68.1	61.5	56.9	65.9
Turnover Ratio		0.668	0.705	0.732	0.768
Net Free Liability Per Dollar of Premium Earned		1.02	0.87	0.78	0.86

ICBC

Free Liability Ratio	94.6	94.1	98.0	97.0	97.5
Insurance Asset Ratio*	7.1	8.5	10.4	13.1	14.0
Net Free Liability Ratio	87.5	85.6	87.6	83.9	83.5
Turnover Ratio	0.445	0.485	0.555	0.65	0.725
Net Free Liability Per Dollar of Premium Earned	1.96	1.76	1.58	1.29	1.15

MPIC

Free Liability Ratio	98.1	82.6	81.8	83.1	83.8
Insurance Asset Ratio*	16.8	17.2	14.3	15.8	17.1
Net Free Liability Ratio	81.3	65.4	67.5	67.3	66.7
Turnover Ratio	0.714	0.693	0.758	0.826	0.917
Net Free Liability Per Dollar of Premium Earned	1.14	0.94	0.89	0.82	0.73

*Assume cash equals 2% of assets similar to the private plans in order to separate cash out from cash and short term securities.

**SGI prior to 1984.

cents in free liabilities per premium dollar, close to the all insurance average for Canadian companies of 101 cents. ICBC, on the other hand, averages 155 cents per premium dollar of net free liabilities, mainly as a result of a low turnover ratio, which is to say that for every premium dollar earned it has a relatively large amount of unpaid claims and unearned premium income. This could indicate slower payment patterns than SGI and MPIC, which benefits ICBC policyholders (who are not claimants) in having that money available to generate investment income.

The investment income is added to the claims and expense ratios in Table 24 to get the overall underwriting results. This is to be compared with the private sector results in Table 6, where again we would expect the overall results to fluctuate around zero, indicating competitive pricing overall. For the private car insurers the average ratio was -0.006 indicating that overall car insurance underwriting was marginally unprofitable, except that a dramatic deterioration was under way during 1984-85. For the public plans the ratios were MPIC -0.01, ICBC 0.017 and SGI 0.12.

What this data indicates is that both MPIC and ICBC essentially priced their policies accurately overall given their cost structure, but that SGI was unusually profitable. The reason for SGI's high level of profitability is the lack of such profitability in the past and the need to build up a reserve for future contingencies. In 1980 SGI included as a liability \$72M owed to the Crown Investments Corporation of Saskatchewan (CIC), a liability that was non-interest bearing and repayable at the discretion of CIC. However, the balance in the Automobile Accident Insurance Act (AAIA) account was -\$33.4M in 1980. Hence, car premiums had to be above their fair levels to replenish this past deficit. In 1981 the deficit was \$22.5M, in 1982 \$12.56M, in 1983 a surplus of \$14.9M, in 1984 a surplus of \$59.7M and in 1985 a surplus of \$45.8M, but only after \$19.9M had been returned to the policyholders as a bonus. Hence, from 1981-85, SGI in effect overcharged for car insurance because of a need to build up a contingency reserve. Such a pricing policy could not have survived in a competitive marketplace.

It is appropriate at this point to talk of the role of the provincial government guarantee. Essentially, in our model of Section IIb the insurance company consists of

TABLE 24Underwriting Profitability in the Public Sector

	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>
<u>SGI - Autofund</u>					
Claims Ratio		0.992	0.794	0.828	0.874
Expense Ratio		0.151	0.110	0.108	0.149
Free Liability Ratio		1.019	0.872	0.77	0.858
Underwriting Profit/Loss		-0.03	0.22	0.16	0.100
<u>ICBC - Autoplan</u>					
Claims Ratio	1.072	0.968	1.012	0.992	1.02
Expense Ratio	0.152	0.146	0.154	0.149	0.146
Free Liability Ratio	1.96	1.76	1.58	1.29	1.15
Underwriting Profit/Loss	-0.037	0.082	0.035	0.004	0.00
<u>MPIC - Autopac</u>					
Claims Ratio	1.137	1.016	0.942	0.953	0.925
Expense Ratio	0.121	0.114	0.118	0.127	0.119
Free Liability Ratio	1.14	0.94	0.89	0.82	0.73
Underwriting Profit/Loss	-0.149	-0.026	0.053	0.012	0.061

insurance activities and associated investment activities with the link being that writing insurance generates net free liabilities that can be invested. For competitive firms, competition for premium income will effectively give policyholders lower premium rates in return for their effectively providing an interest-free loan to the insurance company prior to settling claims. Given that there is the risk of catastrophic losses from underwriting, private insurers are required to put up equity capital as security, with this equity capital also being invested. However, since the underwriting risk is unsystematic, i.e., random, without restricting investment, there is effectively no cost to having to put up this extra capital. In the same sense, as long as the provinces each guarantee the solvency of their plan and inject and then withdraw funds, as the plan is unprofitable and then profitable, there is no cost to this guarantee.

The above argument is equally valid if the province injects equity capital that remains with the car insurance division. That is, if it adds equity to act as a cushion similar to a private corporation. In this case, the province is entitled to a fair return on its equity capital either through dividends or allowing value to be enhanced by reinvestment. If the equity capital is regularly destroyed, forcing further injections of capital, then this obviously represents a subsidy. Analysis of the recent financial statements does not indicate regular infusions of capital into the public plans, that would warrant an accusation of subsidy.

However, the financial statements do indicate political intrusion. MPIC clearly should have raised its premium rates in 1986 as it effectively lost 14.9 cents on every net premium dollar earned. The rates for SGI from 1981 indicate higher-than-needed rates to compensate for past pricing mistakes. Similarly, ICBC had to have an infusion of capital in 1976 to avoid raising rates and violating political promises. In all cases, there is clear political intervention and rate manipulation that would not have existed in a competitive market. However, these 'on-off' instances of political intervention do not negate the conclusions of Table 17 that car insurance policies written by MPIC and ICBC overall have been as competitively priced as those by private insurers.

B. Expense Ratios

In Table 25 there is a more detailed description of the expense ratios for the three public plans which should be compared to the Ontario data in Table 4. First, as previously noted, how some of these costs are allocated is intrinsically arbitrary, since they are common costs. That is, the senior management in SGI, for example, deals with both the general insurance lines and the Autofund, so any precise allocation of their cost must be arbitrary. This is noticeable in the change in SGI expenses from 1982-3 where the Autofund's administration expense ratio dropped by 4.7% as a result of a change in the method of cost allocation. Conversely, as we will see, the administration expense ratio for SGI's general insurance lines jumped by 5.9% between 1982-3. As a result, the expense ratio for MPIC and SGI are suspect, since neither are independent operations.

TABLE 25Expense Ratios

	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>
<u>ICBC</u>					
Claims Adjusting Ratio	9.3	8.7	8.8	9.1	9.5
Administration	7.8	7.8	8.8	8.8	8.4
Commissions	7.5	6.8	6.7	5.9	6.2
Totals	<u>24.6</u>	<u>23.3</u>	<u>24.3</u>	<u>23.8</u>	<u>24.1</u>
<u>MPIC</u>					
Claims Adjusting Ratio	11.8	10.8	10.5	10.3	9.9
Administration	4.3	3.6	4.2	4.9	4.4
Commissions	4.7	4.7	4.5	4.8	4.9
Premium Taxes	3.0	3.0	3.0	3.0	2.7
Totals	<u>23.8</u>	<u>22.1</u>	<u>22.4</u>	<u>23.0</u>	<u>21.9</u>
<u>SGI*</u>					
Claims Adjusting Ratio	8.5	8.5	8.5	8.5	8.5
Administration	7.6	9.8	6.2	6.3	11.0
Commissions	0.9	1.2	0.8	0.9	0.8
Premium Taxes	4.0	4.0	4.0	3.3	3.0
Totals	<u>21.0</u>	<u>23.5</u>	<u>19.5</u>	<u>19.3</u>	<u>23.3</u>

*1986 estimates from AAIA Rate Application, September 1984, as are the claims adjusting ratio estimates.

There are several observations from the data in Table 25. First, the claims adjusting ratios vary between 8.5 and 11.8%, a range which brackets the Ontario claims adjusting ratio of 11.2%. However, the average for the three plans are ICBC 9.1%, MPIC 10.7% and SGI 8.5% which are all below that of Ontario. However, whether the differences are meaningful or not is questionable. SGI does not break out its claims adjusting ratio in its annual report. The author only became aware of this deviation from industry practice by examining SGI's rate application for 1985, where actual claims costs and claims adjusting expenses were broken out for budgeting purposes. From this it is clear that SGI's adjusting expense ratio for automobile insurance is at least 8.5%.

The understatement of SGI's expense ratio does not affect our previous analysis of loss costs and average premium levels; however, from that analysis it became clear that SGI had been over-charging for car insurance to build up contingency reserves. As such, all of its expense ratios are smaller than they would be had SGI been pricing competitively. Hence, the 8.5% is an understatement of SGI's true claims adjusting expense ratio. From this it would appear that the public plans have expense ratios of around 10% and are slightly lower than the Ontario average of 11.2%. Actual claims adjusting expenses could, however, be identical in view of the 1.3% allocation of corporate overhead included in the Ontario average.

The second expense item is administration expenses. The Ontario average here is 6.8% if we divide general expenses between claims settlement and processing costs of 6.8% and agency acquisition costs of 17.5%. Alternatively, we can divide expenses into commissions costs of 11.5% and other net of tax costs of 9.4%. If we use this latter division, administration costs in Ontario are clearly higher than the averages for ICBC of 8.3%, MPIC of 4.3% and SGI of 8.2%. Moreover, the SGI estimate includes the 1985 costs for administering the driver and vehicle licensing system that it took over from the Highway Traffic Board. Hence, we have to conclude that administration expenses are higher in the private sector. Why this should be the case will be discussed in part C of this section.

The third part of the expense ratio is the commission cost paid to the agent generating the policy. Here, the

Ontario average of 11.5% is well above the averages of the public plans of ICBC 6.6%, MPIC 4.7% and SGI 0.91%. However, note that not only is the Ontario average higher, but also there is a wide discrepancy in the commission expense ratio for the three other public plans, with SGI's ratio being almost nothing and MPIC and ICBC somewhere in between. Clearly, there is something determining the commission expense ratio that needs to be analyzed. This too will be taken up in part C.

The last item in the expense ratio is premium taxes, licences and fees. For Ontario, this averaged 3.4% including 3% for premium taxes and 0.4% for licences, fees and allocations to the Federal Superintendent of Insurance, etc. For the public plans SGI's average was 4.0%, MPIC's 3.0% and ICBC's was 0%, since prior to 1986 ICBC did not pay any premium taxes. Since these costs are mandatory and cannot be eliminated it makes sense to only examine total expense ratios after excluding them. In this case total expenses for 1986 become: Ontario 32.1%, ICBC 24.6%, MPIC 20.8% and SGI 17.0%. However, remembering that SGI's expense ratio is understated, Ontario's expenses seem to exceed those of the public plans by between 7.5% and say 13%, mainly as a result of lower commission and general administration expenses. This would amount to between \$29 and \$50 per car based on an estimate of average 1985 premium levels. There is reason to believe that these numbers may overestimate the expense savings, mainly because the public plans do not seem to pay the \$5 fee charged Ontario firms for accessing provincial driving records. Also, many suspect that SGI and MPIC do not pay competitive rates for other services from the provincial civil service. However, costing these benefits is impossible.

Before examining reasons why the Ontario expense ratio is higher than for the public plan, it is interesting to analyze the public plan's performances in non-auto insurance. Table 25 gives the expense ratios for ICBC, SGI and MPIC for general insurance. ICBC sold its general insurance division to the Cumis Group in February 1985. Hence, ICBC's results are only for 1982-4.

There are two striking features to the expense ratios in Table 26. First, they are dramatically different from the same companies' auto expense ratios. MPIC, for example, averages a total expense ratio of 47%, twice its auto

TABLE 26Public Plans General Insurance Results

	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>1982</u>
<u>MPIC</u>					
Claims Adjusting Ratio	5.0	5.9	4.1	4.1	4.3
Administration Ratio	18.0	19.8	15.5	14.8	16.3
Commissions	18.3	19.7	20.7	24.9	24.9
Premium Taxes	4.6	4.7	5.1	2.9	2.2
Total	<u>45.9</u>	<u>50.1</u>	<u>43.4</u>	<u>46.7</u>	<u>47.7</u>
 <u>SGI</u>					
Claims Adjusting*	N/A	N/A	N/A	N/A	N/A
Administration Ratio	N/A	15.9	16.9	17.7	11.0
Commissions	N/A	19.4	19.1	18.7	19.0
Premium Taxes	<u>N/A</u>	4.3	4.6	3.9	3.3
Total		<u>39.6</u>	<u>40.6</u>	<u>40.3</u>	<u>34.1</u>
 <u>ICBC</u>					
Claims Adjusting*			N/A	N/A	N/A
Administration			19.0	19.8	21.0
Commissions			22.5	21.7	18.9
Premium Taxes			<u>3.2</u>	<u>3.2</u>	<u>3.2</u>
Total			<u>44.7</u>	<u>44.7</u>	<u>43.1</u>

*Not broken out included with claims costs.

expense ratio. Moreover, its former strengths in having low administration and commission ratios disappear as these ratios are both over 18%. This is not an isolated incident, since both SGI and ICBC, before being sold, had total expense ratios that must have exceeded 40%, since without including adjusting expenses SGI's averaged 39% and ICBC's 44.2%.

Second, the public plan's expense ratios compare very unfavourably with the private companies' non-auto expense ratios in Table 3. For 1985, private companies averaged a total expense ratio of 36.8% for personal lines, 39% for property and 32.1% for other lines, all excluding claims adjusting expenses so as to be comparable with the data for ICBC and SGI. It may be argued that ICBC and MPIC are not comparable with 'average' private firms because they both concentrated on reinsurance. This may be true, but SGI is a broad-based property and casualty insurer and its expense ratio does not seem to be better than those of private insurers.

The lesson from examining the public plan's general insurance expense ratios is that they have not found some secret weapon that allows them to outcompete competitive private insurance companies. When public plans compete on the same basis as private companies they either fail, as ICBC did, have severe problems as MPIC had in 1985, or they look very similar to private companies as SGI does. The 'superior' performance of the public plans in lowering their auto expense ratios must not therefore be due to any superior business/management skills possessed by MPIC, ICBC and SGI, but must be due instead either to some systemic factors that produce lower expense ratios in a public monopoly, or to implicit subsidies available to them by being integrated into the respective provincial civil services.

C. Public Plans' Rating Practices

Each public plan has a different method for setting premiums. In this section we will briefly discuss each plan; a more extensive discussion is at Appendix B to this section.

(i) SGI - Autofund

SGI charges a premium based on three elements. First, there is a premium charged to cover third party liability of \$79 and to cover accident benefits of \$17. Second, there is a premium charged to cover all perils damage to the insured car which varies according to the value of the car. SGI provides a booklet outlining both of these fees, so that insurance costs are immediately known as soon as the vehicle registration is surrendered. For example, a 1987 Mercury Sable costs \$400 to insure, a 1980 Honda Accord \$245 and a 1974 Austin Marina \$175. Finally, surcharges are based on the individual's at fault accident history and driving record over the past three years; each accident costs \$50 and each driving infraction adds rating units with surcharges being a function of the number of rating units.

An individual suspended for 6-12 months in the past three years would have a surcharge of \$135, since this infraction is worth 16 rating units. If the individual also had three accidents over the three years, then this would add another \$150. If the individual decided to drive a 1987 Jaguar XJS rated at \$670 then the total insurance premium would be \$915. The individual driving the 1974 Austin Marina with a clean driving record and no accidents would pay the basic \$175.

SGI removed the \$15 driver's insurance premium in 1985, when it took over the administration of the driver and vehicle licensing system. SGI has not received any subsidy from gasoline taxes since 1982. In 1985 SGI also introduced a 10% discount on rates for farmers.

(ii) MPIC - Autopac

MPIC-Autopac operates on similar lines to SGI's Autofund. A premium is again charged according to the type of car with surcharges based on accident and driving history. Demerit points are given for driving infractions and each demerit point over 6 adds a surcharge of \$25. Conversely, merit points are accrued at a rate of two per year up to a maximum of five for each year without an infraction or accident. Similarly, drivers who are held 50% liable for two or more accidents in any twelve-month period are assessed a surcharge of \$100 with each additional accident adding \$200. Only in 1986 did MPIC remove age, sex and

marital status as a basis for setting insurance premiums. Unlike SGI, MPIC still charges a common driver's insurance premium of \$15 on the grounds that "it is usually the driver who causes accidents to happen."

Like SGI, MPIC's coverage includes third party liability, no-fault accident benefits and compulsory all perils coverage on the car. There is also the ability to buy extension coverage to increase third party liability beyond \$200,000, reduce the \$200 deductible on all perils and insure against an under-insured motorist.

(iii) ICBC - Autoplan

ICBC's Autoplan is by far the most complicated of the three public plans. The compulsory coverage includes third party liability up to \$200,000, no-fault accident benefits and damage caused by an uninsured or unidentified motorist (hit-and-run). Unlike SGI and MPIC, it does not include damage coverage to the car, i.e., all perils, comprehensive or collision. This latter coverage along with under-insured motorist protection and extending the third party liability limit is available on an option.

The rating structure is also unlike that of SGI and MPIC, since it includes many of the variables used by private sector insurers. The premium is determined by five basic factors:

- Purpose of use: which includes four basic categories -- pleasure only; pleasure and drive to work; business; and seniors pleasure driving only.
- Territory: seven regional divisions within B.C.
- Value and age of the vehicle: for example, rate group 3 includes 1979 Pinto, 1978 Cutlass Supreme and 1975 Toyota Landcruiser.
- The claim record of the owner with a 10% discount for each claim-free year up to a maximum of 40% and a 30% surcharge for each claim. In all circumstances the premium returns to its base level after three claims-free years of driving and the insured always has the option of

paying the claim privately and not taking the surcharge.

- A driver insurance premium based on the individual's driving record.

In evaluating the three public plans, it is apparent that ICBC is midway between the public plans of MPIC and SGI and the private sector plans. This is important since in Table 25, ICBC's expense ratio was much higher than that of MPIC or SGI. The reason for these discrepancies now becomes clear. The public plans achieve economies not because of their size, but because of the simplicity of their rating structure. The more sophisticated the rating structure the more paper work required to evaluate a driver and the more analysis required in setting rates.

As a result, the simple plans of SGI and MPIC that enforce massive subsidization of bad risks by good risks have low expenses. The private plans that for competitive reasons have to refine risks because otherwise they would get 'bad' risks for average rates, of necessity have higher expense ratios. ICBC seems to operate midway between the two by maintaining moderate cross-subsidization and operating a quite complicated rating structure.

With this framework, it now becomes clear that the higher expense ratios in the private sector are not indicative of inefficiency, nor are they indicative of economies of scale. The higher expense ratios in the private sector are indicative of a competitive reaction to refine the rate structure and price policies as accurately as possible, to estimate the true cost of coverage. It is for this reason that administrative costs are higher for the private insurance company, since they reflect the administration of a more sophisticated rating structure. Commission expenses are higher at the broker level because of the more time-consuming job of evaluating individuals and shopping the market.

It is quite clear that a public monopoly can operate insurance more cheaply by removing freedom of choice and enforcing cross-subsidization. At an extreme level, the federal government could create one insurance company with compulsory third party liability, accident benefits and all perils coverage. This coverage would cost the same for everybody regardless of age, sex, marital status,

region of the country, driving and accident record, value of the insured car or whether or not the driver was a farmer. This policy would have almost no expenses to administer, since the fee could be paid with the driver's licence and the 'policy' could be available at any vehicle registration or post office.

Such a plan could still have fault or no-fault, so there would be little direct impact on claims costs, but the expense ratio would fall dramatically, since there would be little administration costs and no commissions to pay. Such a plan could not be introduced by private firms unless, legally, insurance companies were prohibited from any rate classification at all. Even in this case, a company, by restricting its geographical coverage, would implicitly discriminate with the result that Toronto would have no companies or brokers offering insurance!

It is thus apparent that the expense ratio is not indicative of efficiency, but instead is indicative only of the government's restriction of choice and mandatory cross-subsidization. It is equivalent to looking at design costs as a measure of efficiency when comparing a private car company and a nationalized car company producing one model, available in any colour as long as it's black. Obviously, the cost of producing a car or any other consumer product would also be reduced in the face of a similar massive reduction in choice.

With these comments in mind the survey of auto premiums undertaken by the Toronto Star in Table 27 becomes understandable. First, it is obvious that high risk groups will find coverage cheaper in the public plans, since they are being subsidized by the low risk groups. In Table 27 the 22 year old female driving to work in Toronto with a clean driving record pays an average \$763.50, and the equivalent male \$1,321.83 or 73% more. This is basically the same as the all-Canada loss costs for BIPD, accident benefits and collision in Table 11, where the male had a 69.7% surcharge over the equivalent female. Obviously these rates are higher than the ICBC rates, which subsidize their high risk groups.

For the even higher risk category, the 22 year old who has already been at fault in an accident, the private premium averages \$3,376, or a whopping 817% more than the same person insured through ICBC. The reason of course is

TABLE 27Relative Car Insurance Premiums

<u>Company</u>	<u>Toronto</u>	<u>Vancouver</u>	<u>Use</u>
Allstate	498		
Wawanesa	553		Age: 43
Royal	571		Claims-Free: 6 years
State Farm	647		Drives to work
Co-Operators	650		1978 Phoenix
Economical	674		
ICBC		529	
Royal	4,191		
Co-Operators	4,066		Age: 22 male
Wawanesa	3,600		Pleasure use
Economical	3,473		One at fault accident
State Farm	1,554		1979 Volare Wagon
ICBC		413	"mother's" car
Royal	1,122 (666)		
State Farm	1,192 (742)		Age: 22 male
Economical	1,218 (778)		Claims-free: 6 years
Wawanesa	1,260 (782)		Drives to work
Co-Operators	1,278 (792)		1979 Volare Wagon
Allstate	1,861 (821)		(brackets are for female)
ICBC		529	

Overall Coverage: 1,000,000 liability, collision with \$250 deductible, comprehensive \$50 deductible, and underinsured motorist protection.

Source: Toronto Star (April 12, 1987).

that because of the individual's age, sex and accident history he has signalled that he belongs to an expensive class to insure. Hence, the level of subsidization in the ICBC rates is even higher.

The final group is the 43 year old male with six years claims-free driving experience who drives to work. Here the picture is different; the average private sector premium is \$598 or \$70 more than ICBC. Whether this is a reasonable premium or not depends on whether loss costs in Toronto for this class are higher than in Vancouver. Given the substantial regional variability the difference may not be significant. Moreover, as always in a private sector insurance market, some insurers are signalling their unwillingness to insure this risk by charging higher prices. The premiums charged by Economical, Co-Operators and State Farm average \$159 more than for Allstate. If the individual shopped around, he would have found a private sector rate \$31 cheaper than ICBC.

This game of premium comparison has become popular, but given the substantial variability in premiums charged for the same risk in the private sector and the obvious cross-subsidization evident in the public plans, it is also a meaningless exercise.

What is of more interest is whether the private sector premiums charged in Table 27 are out of line with the underlying expected cost of insuring this risk. Although, the author is not an expert in setting insurance rates, a rough estimate of appropriate rates is provided in Table 28. The rates are found for bodily injury, collision, comprehensive and accident benefits from the loss costs taken from the 1986 Green Book. The average loss costs for the four classifications that seem to correspond closest to the Toronto Star's descriptions for Canada as a whole were then revalued to reflect the Toronto 'surcharge', since liability and collision loss costs exceed the Canada-wide averages by 44.6% and 27.5% respectively. Comprehensive and accident benefit loss costs are not available by class so values were estimated based on the Toronto loss costs and the loss cost differentials of each of the individual classes.

TABLE 281986 Premium Estimates

	<u>Classes</u>				
	<u>025</u>	<u>120</u>	<u>125</u>	<u>195</u>	<u>Toronto</u>
BIPD	337.1	1179.3	702.6	395.3	372.5
Collision	129.2	407.1	303.7	183.2	141.5
Comprehensive*	42.3	140.6	93.8	54.2	46.1
Accident Benefits*	41.9	139.1	92.9	54.2	46.1
1986 Loss Cost	550.5	1866.1	1193.0	687.5	606.6
"Premium"	632.7	2144.0	1371.0	790.2	
Differential	1	+239%	+127%	+25%	
Star Average					
Premium	598.8	3376.8	1321.8	763.5	
	1	+464%	+121%	+27%	

*Estimates based on Toronto and class surcharges.

A premium was then calculated based on the formula,

$$\text{loss cost} + 0.25P - 0.12P = P$$

where 0.25 is the expense ratio and 12% is the contribution of investment income. The above formula ensures that premiums cover all costs and account for the contribution of investment income. The result is the rough premium of \$632.7 for the 43 year old with 6 years claims-free driving, \$2,144 for the 22 year old male with a recent accident, \$1,371 for the claims-free 22 year old male and \$790.2 for the claims-free 22 year old female.

These premiums can only be generally compared with the premiums quoted in the Star because the Star's quotes were for \$1M of third party liability, whereas the loss costs in the Green Book are for \$200,000 of average. This underestimate of the liability loss cost has its greatest impact on the 22 year old male driver who has had an accident, since the expected loss cost for liability for this individual is by far the greatest. The estimated premiums are slightly higher than the Star's average premium, but in all cases would be indistinguishable from an actual quotation by another insurance company. Moreover, the differential premiums for the 22 year old male and female without an accident are almost the same for the estimates

as for the average premiums obtained by the Star. All this seems to indicate that the Star's quotes seem to be eminently sensible and in line with the current costs associated with the coverages.

VI. CONCLUSIONS

It would be very easy to analyze each public plan in detail and report on the introduction of 'innovations', such as "dial a claim" or centralized claim centres or the differences in coverage. However, such an exercise merely confuses the issue. Some of the claimed advantages and disadvantages and coverage comparisons are included as an appendix. However, the key features that should be analyzed are those of efficiency.

In this paper we have found that the private sector plans are efficient, given the constraints under which they operate, and that there are no economies of scale in the car insurance business. This does not mean that car insurance premiums could not be lowered overall. It would be perfectly possible to lower claims costs by the following systemic measures:

(a) No-fault insurance. Although this paper cannot get into the pros and cons of no-fault, it is quite clear that legal costs are included as part of claims costs. Hence, by their removal, claims costs must fall. The car insurance companies seem to be efficient given the current tort system. If no-fault insurance cuts legal costs, then competition would ensure that these gains are passed on to consumers.

(b) Restrictions on awards. The introduction of non-negotiable awards for bodily injury would also reduce claims costs. In the same way worker's compensation has reduced costs by awarding statutory benefits.

(c) Restrictions on damage costs. The enforcement of higher deductibles, the use of second hand parts in car repairs (as practised and sanctioned by ICBC) and a take-it-or-leave-it estimate from a government adjustor could all potentially lower claims costs.

(d) Restricting the right to drive. Clearly, under-18 year olds have more accidents, which are also more expensive. Overall insurance premiums would come down if the driving age were raised and if individuals with repeat offenses suffered automatic suspension of driving privileges. The choice of an age when driving is permitted is arbitrary, weighing the rights of an individual to drive against the rights of society to protect itself from bad

drivers. If individuals are not forced to reimburse society for the expected cost of their driving experience, then it might be better to ban them completely.

It would also be possible to lower expenses by simplifying the rate structure and enforcing mandatory cross-subsidization. This would involve:

(a) the elimination of commissions, since there would be no need to shop the market or explain complicated policies to applicants;

(b) the reduction of administration costs, since there would be no need to devise sophisticated rating structures;

(c) tying insurance to driver's licences or plates, thus reducing the paperwork involved.

Individual private corporations cannot do any of this, since it would be a recipe for business failure.

The Government would only want to do this if it is possible to reduce overall costs so much in a public plan, that the extra costs paid by low risk groups due to cross-subsidization are offset by the overall savings in commissions and administration. This question is addressed by Table 29 where estimated premiums are built up for Ontario as a whole for the major rate classifications. The procedure is the same as was used for Table 22. Loss costs are used for Canada-wide data from the Green Book and then an overall policy consisting of BIPD, collision, comprehensive and accident benefit, was created by grossing-up for the Ontario surcharge over the Canada-wide loss costs.

For Ontario as a whole, the policy would have 'cost' \$561.3 using a 25% expense ratio and 12% for investment income. If through public ownership overall expense costs were reduced to 19% in line with those of ICBC, then the overall premium would fall to \$525.09, a saving of \$36.21. Further, if everyone was charged the same rate of \$525.09 regardless of driving record and the previous rate class, then rates would change as indicated in Table 29.

Overall, the savings are not great enough to allow everyone to benefit from a drop in insurance rates. In

particular, class 01 with about 43.4% of the Ontario driving population (by BIPD weights) would see premiums increase by almost \$55 or 11.6%. Note that class 06 is an anomaly, since this is for an occasional driver under 25 for pleasure only, but the principal operator insures the car under either class 01, 02, 03, 04 or 17. For all other classes premiums would fall including class 02, the second most populous group with 33.8% of the driving population. However, for this group the savings is only about 4%, which, given the estimation problems, is probably not significant. For the really small classes, such as young drivers, the cost savings are dramatic, indicating that a small cross-subsidy by a large number of drivers can dramatically help the few paying very high premium levels.

TABLE 29

Ontario-Wide Rate Classes

<u>Class</u>	<u>Estimated Premium</u>	<u>% in* Class</u>	<u>Gain/Loss</u>
01	470.5	43.43	-54.59
02	548.5	33.86	23.41
03	598.2	6.39	73.41
07	647.8	3.64	122.71
06	317.6	3.35	-207.49
08	1828.4	0.06	1303.31
09	1079.0	1.17	553.91
18	999.4	0.96	474.31
19	726.5	3.0	201.41
10	1920.7	0.29	1395.61
11	1668.9	0.73	1143.81
12	1255.8	1.48	730.71
13	1044.7	1.66	519.61

Overall average \$561.3

Public rate \$525.09

*From BIPD loss cost data.

Private passenger cars, excluding farmers.

The results in Table 29 are suggestive only, since the premiums were built up from 1986 loss costs and may not reflect actual premium levels. It is also to be expected that as premium levels for the high risk groups come down,

more drivers in these categories will drive. The result will be a deterioration in the average quality of drivers in Ontario, as more younger drivers decide to get Camaros immediately, rather than driving their parents' Dodge Aries until they have built up a reasonable claims-free period. In this case, the estimates in Table 29 are too high, since the average premium will rise.

The focus in this paper has been on the allocation of savings from lowering commissions and administrative expenses. Further savings may come from limiting lawyers' fees through no-fault or claimant's reimbursements through fixed compensation schedules. However, it is the opinion of this author that forcing the bulk of the Ontario population who are over 25, who have never had a claim and do not use their cars for business purposes, to subsidize the minority that cause a disproportionately larger share of the expensive accidents is counterproductive and economically inefficient, since it will just encourage more of the bad risks to drive. It also seems strange, to say the least, that farmers in rural areas of Ontario should subsidize 19 year olds in Toronto so that they can drive Firebirds and Camaros. A final reminder is that the age and marital status grouping is essentially a generational subsidy, since unmarried young males usually become old married males. The sex discrimination is a separate question and it seems strange to discriminate against females by charging a higher rate than the group warrants.

APPENDIX A: THE HISTORY OF PUBLIC INSURANCE PLANS

Saskatchewan (SGIO)

The Saskatchewan Government Insurance Office (SGIO) was established in 1944 in response to complaints of poor private sector coverage of rural markets. Although SGIO initially competed openly with private insurers, the implementation of compulsory basic no-fault auto insurance in 1946 included a provision giving SGIO exclusive rights to the compulsory portion of the auto insurance market. The compulsory basic policy now includes third party liability (\$200,000 minimum), accident benefits and all perils vehicle coverage (\$500 deductible). The extension coverage market remains open to competition, although the one-stop conveniences advantage of SGIO allows them to dominate this market.

Manitoba (MPIC)

Prior to 1970, Manitoba suffered from a serious problem of uninsured automobiles. It was concluded that compulsory basic coverage was needed and that the best way to administer such a plan was to create a monopolistic Crown Corporation, the Manitoba Public Insurance Corporation (MPIC). The coverage, called Autopac, includes compulsory accident benefits, third party liability (\$200,000 minimum), and all perils vehicle coverage (\$200 deductible). MPIC also dominates the extension coverage market and competes with private companies in other types of insurance.

British Columbia (ICBC)

In 1968, a Royal Commission in B.C. criticized the practices of the private auto insurance industry for providing poor service, being unresponsive to their customers' concerns, operating inefficiently and being overly selective in the risks they chose. After third party and accident benefits coverages became mandatory in 1970, the problem of availability became more severe and in 1973 the Insurance Corporation of British Columbia (ICBC) was established and given exclusive rights to the entire auto in-

surance market. In 1976, private insurers were allowed to re-enter the market for voluntary extension coverage of vehicle damage, but ICBC continues to write virtually all automobile insurance policies. While both third party liability and accident benefits coverage remain compulsory, B.C.'s plan differs from those in Manitoba and Saskatchewan in that collision coverage is optional in B.C.

APPENDIX B: RATE-SETTING METHODS AND CRITERIA

Saskatchewan

Saskatchewan's Autofund rating system is broken into two components: vehicle insurance premiums and driver licence premiums.

Vehicle insurance premiums are intended to reflect the variability of insurance costs for different automobiles. Both the average repair cost and the frequency of accidents of a given vehicle are considered in assigning damageability ratings and premiums are then paid based on those ratings. Premiums for most new cars are between \$300 and \$500 with none over \$660 (1985 rates).

Driver licence premiums are used to penalize drivers with poor driving records based on the fact that these drivers are more likely to be involved in accidents. Rating points are assessed for various traffic offences (for example, excessive noise is 1 point, following too closely is 2 points, racing is 4 points, etc.). Premiums are then charged on the basis of how many rating points a driver has accumulated, as shown below.

<u>Class - Rating Units</u>	<u>Basic Premium</u>
A - 3 or fewer	\$ 0
B - 4 or 5	\$ 25
C - 6 or 7	\$ 35
D - 8 or 9	\$ 55
E - 10 or 11	\$ 75
F - 12 or 13	\$ 95
G - 14 or 15	\$115
H - 16 or 17	\$135
I - 18 or 19	\$155
K - 20 or 21	\$175
M - 22 or more	\$175 plus \$30 for each point over 21.

This scale punishes habitually reckless drivers, while holding back punishment until a driver has a substantial record of poor driving.

Driver licence premiums are also assessed against drivers who have histories of at-fault (50% or more) accidents in which Autofund paid \$105 or more. Each such

accident within the previous three-year period results in a \$50 premium against the driver. A major complaint against this premium assessment is that fault is not vigorously investigated and there is a tendency to assign 50% fault to each driver in a two-car collision, thereby costing each driver \$50.

Manitoba

Manitoba's Autopac plan is very similar to that of Saskatchewan, with some subtle but important differences. These changes are used to maintain simplicity and avoid any discriminatory labelling of driver groups.

Vehicle premiums in Manitoba are based on the value and principal use of the vehicle only, so that a person is not penalized by the fact that other drivers of the same model automobile may be more prone to accidents. The use of automobile values rather than repair costs does not have much effect on premiums, but it does simplify the system by replacing a statistical exercise with the simple book of car prices. The inclusion of principal use also helps to raise the contribution from commercial and business vehicles which are more prone to accidents because they are on the road more.

Manitoba's driver licence premiums are also slightly different from Saskatchewan's. While it works the same way as Autofund, Autopac emphasizes the driver premiums more heavily, shows more compassion for marginal drivers and punishes bad drivers more heavily. The assessment schedule, as shown below, jumps from no penalty to \$150, thereby distinguishing very sharply between what are considered good and bad drivers.

<u>Demerit Points</u>	<u>Premium Assessment</u>	<u>Demerit Points</u>	<u>Premium Assessment</u>
0-5	\$ 0	13	\$287
6	\$150	14	\$312
7	\$162	15	\$337
8	\$175	16	\$362
9	\$187	17	\$387
10	\$212	18	\$412
11	\$237	19	\$437
12	\$262	20	\$462
		21 and over	\$490

In the case of previous accidents, only accidents within the previous 12 months are considered and there is no charge for the first accident each year. Subsequent accidents, however, result in hefty charges of \$150 each.

British Columbia

British Columbia's Autoplan uses a more complicated system for applying premiums, more closely resembling private sector methods. Five factors are considered in setting premiums:

- value and age of the automobile (Rate Group)
- the territory where it is principally operated
- the purpose for which it is used (Rate Class)
- the cost of prior years' claims under each rate class
- the claims record of the owner and/or driver.

The first four factors determine the base rate premium and then the fifth factor is used to apply a discount or premium.

The size of the discount or surcharge is determined using a claims-rated scale. New drivers enter at the base rate and can move down (discount) one level for each claim-free year (maximum 4 levels or 40% off). Conversely each third party liability or collision claim paid results, in an upward (surcharge) move of three levels (no limit). The claim-rating scale is shown below.

etc.	etc.	
+ 12	+250%	
+ 11	+225%	
+ 10	+200%	
+ 9	+150%	
+ 8	+125%	
+ 7	+100%	
+ 6	+ 75%	
+ 5	+ 60%	SURCHARGE
+ 4	+ 45%	
+ 3	+ 30%	
+ 2	+ 20%	
+ 1	+ 10%	

BASE RATE

- 1	- 10%	
- 2	- 20%	DISCOUNT
- 3	- 30%	
- 4	- 40%	

The long-lasting effects of a claim often justify paying minor claims yourself and using insurance only as security against the financial hardship that would be caused by a major accident. After all, that is the motivation for insurance in the first place.

This system is similar to those used by private industry in that it groups people based on what are considered important factors and then uses statistical methods to try to predict future claims to the group as a whole. Once that is done, individual records are used to fine tune each premium assessment.

APPENDIX C: ARGUMENTS FOR AND AGAINST PUBLIC OWNERSHIPFORAGAINSTPremiums

Reduced premiums due to investment income and operating efficiencies (see below).

Lower premiums are an illusion clouded by hidden revenues (such as gas tax) and subsidies (see below). Investment income also directly lowers private insurance premiums and potential efficiencies are negated by unions and the waste inherent in the public sector.

Efficiency

Improved efficiency in terms of the fraction of premiums returned as claims as a result of:

- non-adversarial system saves on legal and negotiating costs
- restructured claims and settlement procedures which streamline claims and simplify systems for paying repair shops
- reduced delivery costs
- economies of scale

The use of Intercompany Settlement Charts by private insurers already restricts the use of courts for collision cases to those in which doubt exists as to fault. Gradual decrease in efficiency due to union labor costs, poor incentive structure and the absence of a bottom line. Increased visibility and public scrutiny create the need for more documentation and internal checks and balances for decisions.

Fairness

More equitable and fair compensation system

Oversimplification of rating system is unfair.

because it avoids unpredictable courts. Rates are set based on individual driving records so that unfair age and sex discrimination is avoided.

Unfair to safe drivers because poor drivers would be subsidized too much and incentives lessened. Tendency to oversimplify adjusting decisions by arbitrarily assessing equal fault in order to streamline operations.

Hidden Subsidies

ICBC subsidizes other government departments through:

- discounts to seniors and disabled
- hospital plan contributions
- free use of ICBC computers

Public plans are subsidized by:

- paying no premium or corporate taxes
- free access to police records
- maintaining no loss reserves

Availability and Affordability

No residual market

Residual market is adequately served by the Facility Association. Availability of other types of insurance may suffer if some private insurers leave.

Ability to provide affordable insurance to high risk drivers through subsidization.

High risk drivers are already subsidized. Further subsidies would lessen incentives and be unfair to safe drivers.

Law Enforcement

Effective means of enforcing compulsory insurance.

Investment Income

Investment income is utilized in Ontario, rather than being a drain on available capital.

Integrated world capital markets are readily accessible from Ontario so this factor would have no effect on either the availability or cost of capital. Also, 1982 figures show that ICBC has 82% of its funds in Government of Canada bonds and bank deposits and only 18% in B.C. and municipal bonds.

Quality of Service

Public convenience due to:

- one-stop shopping and claims adjusting
- less hassle in settling claims
- direct dealings with insurance companies.

Poorer service because there is no threat of losing a customer and public employees lack motivation. Studies of public perception also support this view of public companies.

Profits

Profits are used to increase benefits, reduce premiums and absorb losses, rather than being distributed as dividends. Taxes not paid to Federal government.

Loss of corporate taxes must be made up by increasing other taxes.

Note: Ontario could ask for profit remission for private companies similar to private provincial power companies.

Social Benefits

Better organization of driver education and research programs due to centralized information and resources.

In-province head office prevents cash flows to out-of-province head office.

Greater commitment and responsiveness to social needs.

Existing education programs have been effective.

Most Canadian firms have head offices in Toronto and foreign firms also have large offices here.

Potential for use as a political vehicle, violating sound business and insurance practices. Need for mechanisms to control monopoly prices and practices.

Impact on Repair Industry and Costs

Lower repair costs due to monopoly power over repair shops and more research into new repair methods.

Private insurers presently get discounts from shops for promising volume, a practice which would be inappropriate for a public company. May disrupt healthy competitiveness between repair shops by introducing significant economies of scale, to a unionized oligopoly.

Start-Up Difficulties

Early difficulties are common to all businesses and are worth it for the long-term savings.

Logistical problems associated with starting such a large company from scratch.

Confusion during change-over due to staggered policy renewals.

Tendency towards higher claims frequency during early stages as people take advantage of what they see as a bottomless public purse.

Philosophical Issues

Insurance premiums should be:

- based on individual records
- affordable for all
- available to all
- provide adequate compensation to all injured parties regardless of fault
- not force drivers to contribute to private sector profits.

The free market is the cornerstone of a free society. In claims settlement public insurance companies represent the interests of society as a whole, rather than individual customers. Public ownership is not a solution to problems with the products. Public opinion currently favours less government involvement.

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THE STRUCTURE OF THE
ONTARIO AUTOMOBILE
INSURANCE INDUSTRY

Prepared for the Inquiry Into Motor
Vehicle Accident Compensation in Ontario

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EXECUTIVE SUMMARY

This chapter analyzes the Ontario automobile insurance market from the point of view of industrial organization, which is the branch of economics concerned with industry analysis. The first part of the chapter summarizes some of the main currents of the dominant paradigm in industrial organization, which links the outcomes produced by an industry to the structure of that industry. The second part of the chapter examines the structure of the Ontario auto insurance market. We conclude that:

1. There is a large number of firms in the industry.
2. From 1974 to 1979, concentration in the industry increased, while concentration fell between 1979 and 1984.
3. The empirical evidence suggests that for automobile insurance, scale economies were non-existent.
4. The insurance industry does not appear to exhibit economies of scope, which means that multiple line firms do not appear to enjoy any cost advantages relative to single line firms.
5. During the period 1975 to 1984, there was significant entry into and exit from the automobile insurance industry.
6. Net exit from automobile underwriting between 1975 and 1984 implies that industry profitability was below normal, in an economic sense, during the period.
7. The structure of the industry makes collusion among firms extremely unlikely.
8. The market for automobile reinsurance appears to have a competitive structure. There appears to be no difference in the extent to which small and large firms reinsure.
9. The Registered Insurance Brokers Act (Ontario) deters entry into insurance brokerage, to the potential detriment of consumers.

INDUSTRIAL ORGANIZATION THEORY AND RESULTS

Why Market Structure Matters

This chapter presents an analysis of the structure of the Ontario automobile insurance market. Since the number of consumers of automobile insurance is quite large relative to the number of companies writing that insurance, we shall focus on the sellers' side of the market. The rationale for examining market structure is that economic theory predicts that there are strong links between the structure of an industry and the competitive outcomes generated by that industry.

The two extreme examples of market structure are perfect competition and monopoly. In the case of perfect competition, there are so many sellers of a homogeneous product that no one firm can influence the market clearing price. Competition in this market will drive the industry toward an equilibrium where prices are just sufficient to cover costs and provide firms with a normal return to capital, where normal returns are just high enough to prevent firms from leaving the industry, but not sufficient to induce other firms to enter the industry. Another term for normal returns is 'zero economic profits', with the implicit idea that zero profit in an economic sense includes a sufficient risk-adjusted rate of return to maintain the level of capital in the industry. The effect of perfect competition in the absence of cost advantages to large scale production (also referred to as scale economies) is to force firms to produce using the most efficient combination of inputs and to charge prices equal to marginal cost (the cost of producing one more unit of output). It can be shown that when prices equal marginal costs throughout the economy, an improvement in one person's or group's welfare can only be achieved at the expense of someone else, a condition known as Pareto optimality. This analysis leads economists to conclude that competitive markets which drive prices toward marginal cost facilitate an efficient allocation of the economy's resources.

The perfect competition model incorporates some strong assumptions which may not always be fulfilled by real world markets. In particular, the results proved for perfectly competitive markets depend on universal access to costless information, costless entry into and exit from

the industry, and the absence of scale economies. The costless information assumption means that neither consumers nor firms need to expend resources in order to inform themselves about market conditions, including product quality and the prices charged by all firms. This may be a particularly unreasonable assumption for the automobile insurance market, where a significant fraction of insurance company expenses seem to be devoted to marketing the product. For example, total Ontario automobile insurance agency and acquisition expenses were 17.5% of premiums in 1985, of which commissions to brokers accounted for 11.5% (source: Insurance Bureau of Canada, 1985 Expense Allocation Program). Of course, not all of these expenses can be counted as marketing expenses; given the available data we can only speculate. However, it is important to remember that the beneficial results which flow from perfect competition do depend on the assumption that the process of competition does not itself consume resources.

The other extreme form of market organization is monopoly, an industry with only one seller. Unlike a perfectly competitive firm, the monopolistic firm does control price. If the goal of the monopoly is to maximize its profits, then it will charge more and produce less than would a perfectly competitive industry producing the same goods. Free from the pressures of competition, the monopoly may also choose to operate less efficiently than a competitive firm, which means that a monopoly will not necessarily earn above normal profits. For example, consider Canada Post Corporation. In any case, absent scale economies, the unregulated monopolistic form of market organization is clearly not in the interests of consumers.

The conclusions regarding monopoly are only true to the extent that the monopoly is able to deter other firms from entering its industry. If costless entry and exit from the industry are possible, then the ability of the monopoly to overcharge, underproduce and operate inefficiently with respect to perfect competition is constrained, since new entrants to the industry could undercut the monopoly's prices and still earn at least normal profits. In fact, new entrants would be attracted to situations where the monopoly was behaving precisely as described in the previous paragraph. This means that to the extent that markets are contestable, i.e., to the extent that costless reversible entry is possible, single-firm

industries will approximate the perfect competition equilibrium. In other words, the conditions of entry into and exit from the industry are important aspects of market structure. The theory of contestable markets develops this idea in its purest form (See W. Baumol, "Contestable Markets: An Uprising in the Theory of Industry Structure," American Economic Review, 1982). A contestable market is one where incumbent firms are vulnerable to costless so-called hit-and-run entry; cost conditions are the same for all firms; there are no sunk costs of entry, and entry can occur before incumbent firms have time to respond. The performance of this market will be optimal in the sense that price will be driven to marginal cost, irrespective of the observed market structure. For example, Fama and Laffer show that even if there are only two firms in each industry, and perfectly free entry and exit for each industry, then each firm is in effect a perfect competitor earning only normal economic profits (E. Fama and A. Laffer, "The Number of Firms and Competition," American Economic Review, 1972). Therefore, the theory of contestable markets offers a powerful alternative to structure-based theories by making entry and exit conditions fundamental and the number of firms irrelevant.

Contestability theory has been criticized on the grounds that the assumptions that imply vulnerability to hit-and-run entry ignore the empirical reality of most industries, where incumbent firms do have potential advantages over potential entrants. For example, some models have focused on the entry deterring properties of consumer brand loyalty, which may itself be a function of previous years' marketing decisions by incumbent companies. Nevertheless, contestability theory has underlined the importance of assumptions about sunk costs in the analysis of entry conditions.

While the theory of contestable markets assumes that sunk costs do not exist, the literature on strategic entry deterrence focuses on the ways in which sunk costs can be used to maintain positions of market dominance. In general, the theory of entry deterrence involves a commitment by the existing firm to spend money on some 'strategic' variable such as advertising, research and development, a distribution system or manufacturing capacity up to a level where the expected payoff to an entrant would be zero or negative. It is vital that the investment by the incumbent firm be irreversible, otherwise the investment

by the incumbent could be undone in the event of entry, and so would not affect the potential entrant's decision. For example, abstracting from legal restrictions, an incumbent could announce that if entry occurred, it would set prices below average cost in order to render the entrant unprofitable. However, this strategy would cause the incumbent firm to incur a short-run loss if the entrant were forced to leave, or a long-run loss if the entrant remained in the industry. Whenever the incumbent firm raised prices above average cost, entry would be profitable. Therefore, a reversible entry deterring policy which implies sacrifice for the incumbent firm is unlikely to be viewed as credible, because no rational incumbent would choose to implement this strategy.

The previous analysis is founded on short-run considerations where the prospect of future entry by a queue of potential entrants is not considered, and where uncertainty about the true nature of the incumbent is not a factor. When we allow for these elements, the analysis becomes much less straightforward, because we must model how potential entrants form expectations about an incumbent's likely response, given information about the incumbent's previous behaviour. In particular, an incumbent's reputation - possibly for short-run irrational behaviour - may be sufficient to deter entry. If, for example, a potential entrant's management assumed that the incumbent would accept protracted subnormal profitability resulting from a price war, even though this would not be optimal in the long run for the incumbent, then entry would be unlikely. The concept is similar to the idea of deterrence used in formulating military strategy. As long as other players can be convinced that threats will be carried out, then the threats are credible. To the extent that an incumbent firm has demonstrated a history of strong reaction to entry, it seems probable that future entry will be deterred.

Perhaps the most important lesson of the theories concerning entry and exit conditions is that those conditions matter to the outcomes generated by an industry. Given the restrictive assumptions of contestability theory, we cannot dismiss structure as irrelevant in most real world examples. We must, however, consider any legal or other factors that could inhibit entry into the industry, along with our assessment of structure, in order to have a complete picture of competitive conditions in an industry.

The two models, perfect competition and monopoly, provide a description of extremes, and all industries in practice fall somewhere between them. The position of any particular industry can be located along this spectrum by examining the structure of that industry in terms of the number of firms and ease of entry and exit. As we move through the spectrum from industries with a large number of firms to industries with only a few firms, we expect that profitability will rise from the normal level to the supernormal level of monopoly.

Most markets can best be described by oligopoly, the case where there are few sellers. Obviously, the definition of "few" is somewhat subjective; however, oligopoly implies that each seller has the ability to influence market prices and the behaviour of its rivals. While there are many formal models of particular aspects of oligopoly, there is no one universally accepted description of the consequences of this form of market organization. The problem is that the key feature of oligopoly is interdependence of firms: the actions of all the individual firms in an oligopoly are affected by the actions of other firms. This interdependence gives rise to the possibility of many different outcomes for prices, output and profitability in a given oligopoly situation.

In general, most oligopoly models focus on the determinants of successful cooperation among firms in order to achieve results similar to those which would be obtained under monopoly. In order for collusion to be successful, the companies must form a cartel in which there are acceptable rules for assigning market shares, detecting cheating by member firms and punishing cheaters. The problem for the industry is that while it always pays to form a cartel, it also always pays member firms to cheat on the cartel, so that there is natural instability in a collusive oligopoly. The reason that it always pays firms to form a cartel is that by coordinating member efforts, the cartel can reduce output below the competitive level, causing an increase in price above marginal cost. However, at the cartel optimum, characterized by low production and high prices with respect to the perfectly competitive solution, any cartel member can earn positive economic profits simply by increasing its output and selling it at a price just below the cartel price. To the extent that all cartel members engage in this form of cheating, the cartel will break down and the industry will behave as

if it were perfectly competitive. We can draw some general inferences about the likelihood of the existence of a sustainable cartel from an examination of market structure. In particular, it will be easier to find agreement, coordinate price and output decisions, and police member behaviour when the number of firms comprising the cartel is relatively small. Policing a cartel requires identifying and punishing firms that break cartel rules. If there are many firms in the industry, then the effect of cheating by any one member of the cartel will probably have a small impact on each other firm, so that retaliation by any one firm will probably be unjustified by the resulting potential gains to the punishing firm. With fewer firms in the industry, the actions of any one firm will be more visible and the relative benefits of punishment probably greater. Therefore, the probability that a successful cartel will be established is inversely related to the number of firms in the industry. It is likely that the smaller the number of firms, the greater the probability of non-competitive prices.

Economic theory has identified many plausible reasons for a positive relationship between market power, the ability of firms to elevate price above marginal cost, and market structure. A key element of market structure is the number of firms in the industry, although other important aspects of structure include barriers to entry into the industry by potential rivals and exit from the industry by existing competitors, as well as the extent to which buyers from the industry are themselves organized. Nevertheless, the relationship between the number of firms in the industry and market power is not perfect. It is possible for an industry with many firms to operate as a cartel and for an industry with only two or three companies to achieve a perfectly competitive outcome; however, these cases are unlikely exceptions to the general theory.

Structure, Conduct and Performance

The analysis of market structure forms part of the general approach of economics to the analysis of industries which has become known as the structure-conduct-performance model. In fact, we used this model in the previous section to draw inferences about the conduct and performance of industries from an examination of their structure. Basically, the structure-conduct-performance model implies that the key to understanding and predicting

the performance of an industry in terms of profitability, growth, marketing strategy, technological progress, etc., is to be found in the structure of the industry. While we focused on the number of firms as the most important element of structure in the previous section, structure also includes factors like the ease of entry into the industry, the cost conditions under which production occurs, and the price elasticity of demand for the product (price elasticity of demand is essentially a measure of the degree to which consumers are sensitive to price in deciding how much to buy). The conduct of firms, which we expect to be heavily influenced by the structure of the industry, includes the objectives of the firms, their price-setting behaviour, marketing and investment strategies, and behaviour toward rivals. Conduct generates the industry's performance, which includes profitability, allocative and technological efficiency, and any other social goals of interest. Figure 1 presents a list of the elements of structure, conduct and performance, starting with the basic conditions which characterize the industry's environment. Performance, particularly allocative efficiency, the degree to which price equals marginal cost, depends on the conduct of buyers and sellers in areas such as implicit and explicit cooperation or rivalry, marketing strategies and product development, to name three of the many aspects of the behaviour of market participants. For example, we expect prices to exceed marginal cost when firms collude, either explicitly or implicitly. Conduct in turn depends on the structure of the market, which can be characterized by the number and size distribution of buyers and sellers, cost conditions in production, barriers to entry and exit by sellers, product differentiation and the presence or absence of substitutes.

FIGURE 1The Structure, Conduct, Performance ModelBasic ConditionsSupply

Raw Materials
Sensitivity
Technology
Unionization
Product Durability
Cyclical/Seasonal
Public Policies

Demand

Price
Substitutes
Rate of Growth
Purchase Method
Marketing Method

Market Structure

Number of Sellers and Buyers
Product Differentiation
Barriers to Entry
Cost Conditions
Vertical Integration
Conglomerateness

Conduct

Pricing Behaviour
Product Strategy
Advertising
Research and Innovation
Capital Spending
Legal Tactics

Performance

Technological and Allocative Efficiency
Other Social Criteria

(From: Scherer, F.M. Industrial Market Structure and Economic Performance. - Houghton Mifflin Company, 1980).

Of course, there are feedback effects not discussed above. For example, structure itself depends on the past conduct of buyers and sellers, which may be determined by past performance. In particular, we would expect some firms to exit from a chronically unprofitable industry, causing a change in structure, in this case an increase in concentration. Furthermore, the analysis of market structure alone cannot be used to draw inferences about conduct and performance. For example, increased seller concentration makes collusion among sellers easier but does not guarantee that cooperation will actually occur. Nevertheless, since market structure has been found to have a strong influence on conduct and performance, any industry analysis must begin with a discussion of structure. The idea that the structure of an industry largely conditions the activities of the companies in that industry means that we shall emphasize the nature of the industry rather than the nature of the firms in the industry. In other words, structure is fundamental.

While actual concentration is likely to be an extremely important determinant of price and profitability, there are several constraints on the behaviour of any industry. These constraints are environmental, from the viewpoint of the industry, in the sense that they are external to the industry. In particular, the presence of substitutes limits the power of an industry over its customers. The reason for this result is quite straightforward. A substitute good is defined as one which has a high cross-price elasticity of demand with the good in question. Essentially, this implies that when the price of good x rises, the consumption of its substitute good rises more than proportionately. Economics textbooks often assert that jam and marmalade are substitutes. Furthermore, the presence of potential entrants checks monopolistic tendencies in oligopolistic industries, as contestability theory demonstrates. Finally, a large number of companies is no guarantee of competition, but simply means that in the absence of non-government-sponsored cooperation, collusion is more difficult.

Economic Definition of the Market

Most theoretical economics deals with a homogeneous product, and the implicit assumption is that there are no close substitutes for that product. For practical work, it is necessary to define "the good", "the market", "the

firm" and "the industry". Defining the good can become quite complicated, although for the purposes of this study it is straightforward because there are really no substitutes for automobile insurance. In general, economists rely on the concept of cross-price elasticities of demand to identify products and markets, or else they use the standard industrial classification. The definition of the firm is somewhat problematic because most firms produce many different products for different markets. Ideally, the "firm" of interest to industrial economists is the division of an actual company producing for a single market. Finally, when we speak of the industry, we can only use data on current participants in the market, since we cannot observe the set of firms which might enter the business. Furthermore, there is an important geographical component to the definition of the market. For example, we could examine the market for a particular good at the level of Toronto, Ontario, Canada, North America, or the world. It is important to remember that the measured levels of concentration will depend on the definition of the product and the market. In general, the more restrictive the definition, the greater the concentration. For example, concentration for meat packing will be greater than for the food industry as a whole. Furthermore, the Ontario market for a given product will be more concentrated than the Canadian market.

Measurement of Market Structure

While economic theory suggests that the vigour of competition is related positively to the number of firms in the relevant industry, the degree of inequality can also matter. For example, an industry with 100 sellers, each with a 1% market share, is likely to be very different from another also with 100 sellers, one with a 90% market share while the remaining 99 produce 10% of industry output. A simple measure that accounts for inequality is the n -firm concentration ratio, which is the sum of the market shares of the n largest firms. The most common are C_4 , the four firm concentration ratio; C_8 , the eight firm ratio; and C_{20} , the 20 firm ratio.

There are no firm benchmarks for these concentration ratios which we can use to infer collusion or competition. We can be reasonably sure that it will be easier to enforce collusion in an industry where C_4 is 90% than in one where C_4 is 15%. Furthermore, we must use some judg-

ment in assessing the implications of concentration ratio data since these measures ignore the constraints on the industry imposed by the presence of substitutes and potential entrants. Nevertheless, concentration ratios provide useful points of comparison across industries or within an industry across time.

A graphical method for presenting the information from a set of n -firm concentration ratios is the Lorenz curve, which plots the percentage of total industry sales accounted for by any given fraction of the total company population, with the firms ranked in order of market share.

If all firms had the same market share, then the Lorenz curve would be a straight line. The Lorenz curve approach has two main disadvantages. First, because the Lorenz curve is simply a measure of inequality, there is a danger of drawing paradoxical inferences when an industry is comprised of a small number of equally sized firms. For example, the Lorenz curve for a duopoly (an industry with two firms) with firms of equal size is a straight line, but this does not imply that monopoly power is absent in this case. The second problem with the Lorenz curve is that its shape is sensitive to errors in defining the number of firms in the industry. The more borderline firms included, the higher the implied degree of inequality.

A measure of concentration which takes into account both the number of firms in the industry and their relative sizes is the Herfindahl index, which is defined as the sum over all firms of the square of each firm's market share. For a pure monopoly, the value of the Herfindahl index is 1.0. As the number of firms increases, the value of the Herfindahl index falls. Conversely, as the degree of inequality among firms rises, so does the value of the Herfindahl index. Because market shares are squared, the Herfindahl index places more weight on the values for large firms.

While the n -firm concentration ratio and the Herfindahl index are quite different in theory, in practice these measures tend to yield similar industry rankings and have highly correlated values. Scherer (1980) reports a correlation of .94 between C_4 and H (the Herfindahl index) for U.S. manufacturing industries, (a correlation of 1.0 implies a perfect linear relationship) and other authors

have observed this close relationship (see, for example, R. Kilpatrick, Review of Economics and Statistics, May 1967).

The previous discussion has focused on seller concentration; however, analogous results and measures hold for the buyer side of the market. In particular, buyer power increases as the number of buyers declines, and we can describe the demand side of the market using the same measures we applied to the supply side.

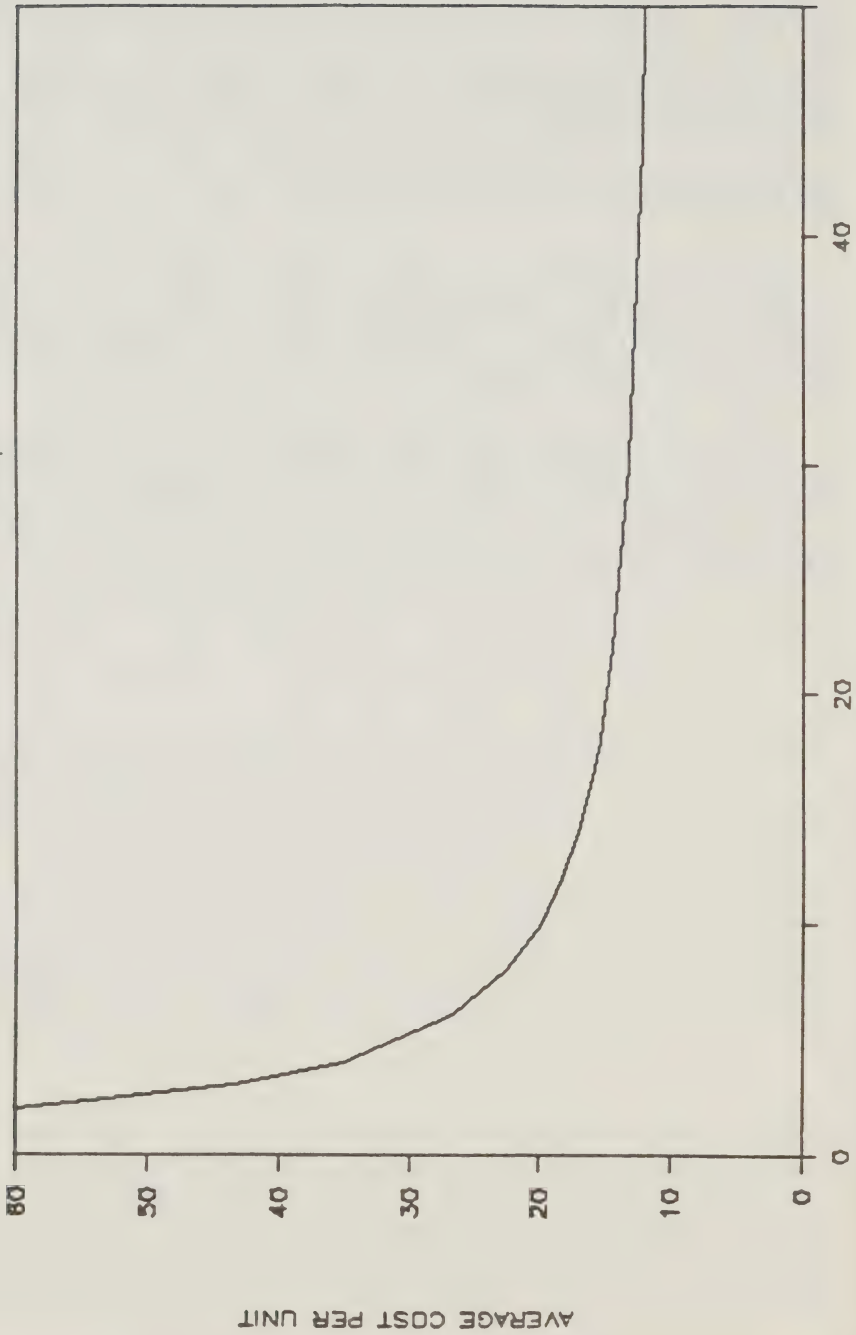
The Determinants of Market Structure

Market structure is not simply random, but rather arises from underlying economic conditions. Any attempt to assess whether a particular market structure is appropriate for an industry therefore needs to be founded on an appraisal of these conditions.

Cost conditions can have a significant effect on the degree of concentration. Consider an industry where each firm faces different average costs at different levels of output as described by Figure 2 (average cost is simply total cost divided by unit output).

FIGURE 2
EXAMPLE OF SCALE ECONOMIES

$$\text{Total Cost} = 100 + 10 \cdot \text{Output}$$



In this situation, a firm with a high level of output can produce at a lower average cost than a smaller firm. Situations like this arise where the ratio of fixed cost to variable cost is relatively large. In economic terms, this industry is characterized by scale economies, otherwise known as increasing returns to scale. The level of output at which average cost flattens out is known as minimum efficient scale. Where there are scale economies, the number of firms is determined by the size of the market relative to minimum efficient scale. For example, consider an industry where the minimum efficient scale is 100,000 units per day and market demand is 1,000,000 units per day. Assuming normal competitive interaction, the maximum number of firms in the industry is $1,000,000 / 100,000$, which equals 10.

Related to the concept of scale economies is the learning curve phenomenon, first documented in aircraft manufacturing (see M. Porter, Competitive Strategy. - Basic Books, 1980). The learning curve describes the reduction in unit costs associated with increases in cumulative output. This is simply a way of saying that firms learn by doing. To the extent that the learning curve describes an industry, then the incumbents in that industry have an advantage over potential entrants, since the incumbents have built cumulative output volume and therefore face lower unit costs than their potential rivals. Of course, technological change can nullify learning curve effects. Furthermore, incumbent firms must keep their experience proprietary in order to use it as a barrier to entry. To the extent that potential entrants can buy expertise, the learning curve is no longer an entry deterrent.

Economies of scope offer firms a potential way of circumventing the disadvantages of being small in an industry characterized by scale economies. Essentially, economies of scope exist when unit costs for a firm which competes in several markets are lower than unit costs for individual firms operating in single markets. Economies of scope arise because of shared expenses across industries. For example, a firm may use one distribution system to service several different products. Similarly, a company may be able to use one head office to manage several business lines. In the insurance industry, it may be the case that small firms can share expenses across several different product lines and therefore maintain their competitive position in the face of larger rivals.

Aside from cost conditions, marketing strategy may influence industry structure. In particular, brand loyalty resulting from promotion and product policy may render consumers relatively insensitive to price, and may hinder entrants' attempts to win market share. Here, marketing strategy serves a dual role: it erects a barrier to entry (structure) and facilitates the maintenance of prices in excess of marginal cost (conduct). The idea that marketing strategy, referred to by industrial economists as product differentiation, might deter entry and raise the profitability of incumbent firms, is seminal (see J. Bain, Barriers to New Competition. - Harvard University Press, 1956). Bain cites high levels of advertising-to-sales ratios as a major source of product differentiation barriers, but recognizes that other aspects of product differentiation include product design and control of distribution channels. While one might argue that as long as potential entrants are not forced to pay costs greater than incumbents have already paid, there is no asymmetry and therefore no entry barrier, it seems clear that advertising has anticompetitive potential for two reasons. First, advertising may reduce the elasticity of demand, in effect making consumers less sensitive to the prices charged by a particular company. To the extent that a firm can use advertising to make consumers believe that there are no good substitutes for its product, it can raise prices above marginal cost. In particular, it can be shown that $(P - MC)/P = 1/ED$, where P is the price charged, MC is the firm's marginal cost, and ED is the elasticity of demand for the firm's product. ED is here defined as $-(P/Q) \cdot (dQ/dP)$, where Q is the quantity consumed and dX means the change in X , which means that elasticity of demand is simply the percentage change in consumer demand induced by a one percent change in price. It is easy to see that as consumers become less price sensitive, in other words as consumers reduce their demand by less for a given price change, then the price cost margin $(P - MC)/P$ rises. The alternative view of advertising is that it simply conveys information to consumers without affecting their demand elasticity and therefore without affecting price. We shall cite some empirical evidence to suggest that the former theory of the effect of advertising is correct. The second reason why advertising may be anticompetitive is that there may be scale economies in advertising. Comanor and Wilson argue that media volume discounts create these scale economies (W. Comanor and T. Wilson, "Advertising, Market Structure and Performance,"

Review of Economics and Statistics, 1967). Furthermore, given its nature as a semi-fixed cost (fixed costs do not vary with output), advertising induces scale economies.

Another area in which economies of scale can act as an entry barrier is research and development. Some authors have found economies of scale in some aspects of research and development (see D. Mueller and J. Tilton, "Research and Development Costs as a Barrier to Entry," Canadian Journal of Economics, 1969).

The presence of economies of scale not only in production but also, perhaps, in advertising and research poses a dilemma for entrants, which are forced to enter at the large scale needed to match incumbents' costs, thereby increasing the financial and business risks of the new venture, or enter at a lower, less risky scale and suffer the resulting disadvantage in unit costs. Advertising and research expenditures are particularly risky because spending on these items cannot be recovered in the event that the new entrant fails. To the extent that capital markets are risk averse, under these conditions entrants will face a higher cost of capital than incumbent firms, which will create another cost disadvantage for entrants.

This brief review of industrial economics theory has highlighted a fundamental prediction of industrial economics. Where the number of firms is small and barriers to the entry of new firms can be erected, it is likely that price will be maintained above marginal cost and firms will earn supernormal profits. In other words, structure interacts with entry barriers to produce superior profitability. Of course, the theory on the nature and effect of these entry barriers is somewhat speculative, and some of it is open to debate among economists. It is therefore worthwhile to examine the empirical evidence in order to test the validity of the theoretical predictions about the effect of market structure on industry performance.

The Price and Profit Consequences of Market Structure

Statistical evidence has generally supported the predictions concerning the impact of market structure on industry profitability summarized above. Joseph Bain conducted pioneering work in the field by attempting to separate the profit consequences of concentration and barriers to entry for a sample of 20 U.S. manufacturing industries.

Bain defined very high barriers to entry as existing in industries where firms had the ability to hold prices 10% or more above minimum unit costs without inducing significant new entry, and substantial barriers to entry as existing where firms could maintain prices 5 to 9% above minimum unit costs without inducing entry. Bain sorted the oligopolistic industries into those with C8 greater than 70% and those with C8 less than or equal to 70%. Bain's results are summarized in Figure 3.

FIGURE 3

Effects of Concentration and Entry Barriers
on Return on Equity

<u>Concentration</u>	<u>Entry Barriers</u>		
	Very High	Substantial	Low
1947-1951			
High	19.0	14.0	15.4
Moderate	--	12.5	10.1
1950-1960			
High	16.4	11.1	11.9
Moderate	--	12.2	8.6

Table reports average industry return on equity.

(Source: 1947-1951: Bain, Joe. Barriers to New Competition. - Harvard University Press, 1956.

1950-1960: Mann, H. Michael. "Seller Concentration, Barriers to Entry and Rates of Return in Thirty Industries," Review of Economics Statistics, August 1966.)

As predicted, the more concentrated industries had generally higher rates of return than the more fragmented industries. Furthermore, the highly concentrated industries with very high entry barriers had substantially greater rates of return than the highly concentrated industries with lower entry barriers. The evidence is based on a rather subjective definition of entry barriers. Furthermore, Bain's use of return on equity as a measure

of profitability is flawed, because return on equity is a function of both return on assets and leverage (the extent to which the company uses debt in its capital structure). Since we are interested in profitability rather than the effects of capital structure, the variable of interest is return on assets; however, Bain presents no information which allows us to disentangle the 'real' and 'financial' effects. Nevertheless, Bain's results do lend some support to the theory that the interaction of concentration and entry barriers determines industry profitability.

Subsequent studies of the determinants of industry profitability used the statistical technique of multiple regression analysis on larger samples of industries. Essentially, multiple regression measures the effect of each explanatory variable on some dependent variable, holding the effect of all other explanatory variables constant. Here, we are interested in the effect of concentration on profitability, holding all other variables constant. A typical example of this work is Weiss' study of 1963 U.S. Census of Manufacturers data for 399 industries (L. Weiss, "The Concentration-Profits Relationship and Antitrust" in H. Goldschmid et al., eds., Industrial Concentration: The New Learning. - Little, Brown, 1974). Weiss found that industry price-cost margins were positively and significantly associated with seller concentration, the ratio of capital to output, the ratio of advertising to sales and past output growth. These results are typical of the vast majority of studies of the concentration-profitability relationship as found by Weiss in his survey of 54 papers on the subject (see above). The overwhelming majority of these studies have some measure of success in statistically relating the basic structural variables to profitability. Concentration in one form or another usually has a significant positive influence. At least some of the variables used as proxies for entry barriers, particularly advertising intensity (defined as the advertising to sales ratio), usually prove significant in any particular study. Nevertheless, there are two important caveats associated with this body of empirical work.

The first problem is one of statistical methodology. Most of the empirical work in industrial organization relies on single equation techniques which, in effect, ignore the feedback linkages from performance and conduct

to structure. In the language of statistics, these studies suffer from simultaneous equations bias, making the conclusions we draw from them somewhat unreliable. One study which attempts to overcome this problem estimates three simultaneous equations explaining advertising intensity, concentration and the price-cost margin (see S. Martin, "Advertising, Concentration and Profitability: The Simultaneity Problem," Bell Journal of Economics, 1979). Martin finds that the most important influences on the price-cost margin are positive effects due to advertising intensity and the growth rate of demand, together with a negative effect of the percentage of domestic sales accounted for by imports, while concentration is insignificant. In a similar study for Canadian data, advertising and a measure of scale economies were positive and significant determinants of price-cost margins, while concentration was significant only when the measure of scale economies was excluded (see V. Gupta, "Structure, Conduct and Performance in Canadian Manufacturing Industries: A Simultaneous Equations Approach," PhD dissertation, University of Toronto, 1977). It is not appropriate to infer from these studies that concentration is irrelevant for two reasons. First, as we have shown, concentration itself depends on scale economies. In a comprehensive simultaneous equations study of Canadian industry, Caves, Porter and Spence conclude that "scale economies wield their influence on profits through concentration and not as the separable influence hypothesized by the traditional theory of entry barriers" (R. Caves, M. Spence and M. Porter, Competition in the Open Economy. - Harvard University Press, 1980, p. 254). Second, the concentration measures used in these studies are themselves flawed, since they exclude foreign firms which may account for large fractions of given markets.

The second problem with the statistical work on the relationship between market structure and profitability is that this work tends to ignore capital market considerations. In particular, the price-cost margins reported as the dependent variables either ignore altogether an imputed cost of capital, or simply use some benchmark interest rate without adjusting it for the risk of the particular business. Modern finance theory predicts that the return on the equity component of a firm's capital structure is a positive function of the extent to which the firm's returns are high when returns on the risky asset market as a whole are high (this theory is known as the capital

asset pricing model, or CAPM). One implication of CAPM is that different firms are quite likely to have different returns on equity **in equilibrium**, which means that an observation of high profitability in one industry relative to another may simply illustrate the relative risks of the two industries.

In summary, the statistical evidence does not reject the hypothesis that more highly concentrated industries protected by entry barriers tend to earn higher rates of return than less concentrated industries without entry barriers. One explanation of this tendency toward greater profitability is that explicit and implicit collusion among firms is easier in more highly concentrated industries. However, much of the empirical evidence can be criticized on statistical, financial and definitional grounds. A priori, we cannot conclude that concentration alone is evidence of market failure or excess profitability. However, we can conclude that lack of concentration gives us very strong grounds for believing that collusion and excess profitability are unlikely to be present.

THE STRUCTURE OF THE ONTARIO AUTOMOBILE INSURANCE MARKET

Given the predictions of industrial organization theory, we can draw some tentative conclusions about the state of competition in the Ontario automobile insurance market by examining the structure of that market. In order to correctly apply the theory, we need accurate definitions of the market and the firm.

Definition of the Market

Most work on market structure uses total revenue as a descriptor of firm size. In principle, this implies that for the automobile insurance industry, we should use net premiums written, which are simply direct premiums written less reinsurance ceded to other companies (or plus reinsurance accepted). However, at the provincial level, we only have data on direct premiums written by a company (see Superintendent of Insurance for Ontario, Annual Report, 1986, which presents 1984 data). Nevertheless, it can be argued that direct premiums written does provide some information about the relationship between consumers and individual companies which is excluded from the net premiums written measure. Consider a hypothetical indus-

try where consumers deal with a monopoly retailer which purchases its goods for resale from a competitive industry. Since in this example, consumers are dealing with a monopoly, they will probably pay higher prices than they would if the competitive industry supplied them directly. Similarly, when firms cede reinsurance, they are in effect acting as retailers to consumers. In order to measure the relative market power of consumers and insurers, we need to consider total sales to consumers by individual companies.

Direct premiums written does have flaws, chief among which is that it gives no information about the market power of reinsurers. If, for example, a large number of firms retailed insurance which they then ceded to a monopoly reinsurer, then the direct premiums measure would drastically understate the degree of market power in the industry.

Another problem that arises in defining the market is that there are in fact several sub-markets for automobile insurance in Ontario. For example, taxicab owners face a very different insurance market than non-commercial drivers. This means that even if the overall insurance industry appears to be competitive, certain consumers may actually face a very limited choice of companies willing to offer them auto insurance. Given the aggregated nature of public statistics on the automobile insurance market in Ontario, it is practically impossible to do more than present interview-based evidence on the structure of these sub-markets. The particular sub-markets we shall be concerned with are taxicabs, long-distance trucking, farm equipment, Northern Ontario, bad drivers and small towns. Therefore, most of the evidence on market structure presented here will apply strictly to insurance for non-commercial drivers for whom access to brokers and/or agents is available.

Definition of the Firm

In 1984, there were 157 companies writing automobile insurance in Ontario (source: Superintendent of Insurance for Ontario, Annual Report for Business of 1984, Toronto, 1986). This figure overstates the true number of economic entities, since many of these firms had the same owner. For example, the Economical Group owned Waterloo Insurance, Economical Mutual Insurance, Missisquoi and Rouville

Insurance and Perth Insurance (source: Canadian Insurance Statistics. - Toronto, 1987). We shall define a group as the collection of all insurance companies with the same owner. There were 112 groups writing insurance in Ontario in 1984, of which 63 accounted for 99.09% of direct premiums written. While it is impossible to know whether the companies in a given group act independently or otherwise, it is true that ownership confers legal control, which includes the power to coordinate the activities of group members. Given this potential control, it is reasonable to proceed with the assumption that the relevant entity for economic analysis is the group.

FIGURE 4

Market Shares of Leading Ontario Automobile Insurers

<u>Company/Group - 1984</u>	<u>Share of Direct Premiums Written</u>
Co-Operators Insurance	9.39%
State Farm Insurance	6.88%
Royal Insurance Group	5.97%
Economical Group	5.58%
Pilot	4.90%
Allstate Insurance	4.20%
General Accident Assurance	3.97%
Zurich	3.64%
Dominion Group	3.47%
Safeco Insurance Group	3.16%
Commercial Union Assurance	3.00%
Home	2.85%
Phoenix Continental Group	2.51%
Fireman's Fund	2.49%
Travellers Canada Group	2.27%
Wawanesa	2.13%
Scottish & York	2.05%
Simcoe Erie Group	1.97%
Canadian General Group	1.92%
Gore Mutual	1.60%

<u>Company/Group - 1979</u>	<u>Share of Direct Premiums Written</u>
Royal Insurance Group	13.29%
Co-Operators Insurance	11.86%
Canadian General Group	5.89%
State Farm Insurance	5.85%
Allstate Group	5.01%
Dominion Group	4.96%
Economical Group	4.53%
Zurich	4.40%
Commercial Union Assurance	4.12%
Fireman's Fund	3.69%
General Accident Assurance	3.12%
Pilot	3.03%
Phoenix Continental Group	2.02%
Travellers Canada	1.93%
Gore Mutual	1.92%
Liberty Mutual Group	1.76%
Wawanesa	1.70%
Guardian	1.68%
Constitution Insurance	1.42%
Scottish & York	1.30%

<u>Company/Group - 1974</u>	<u>Share of Direct Premiums Written</u>
Co-Operators Insurance	8.61%
Royal Insurance Group	7.23%
Dominion Group	6.46%
State Farm Auto	5.12%
Economical Group	4.40%
Zurich	4.03%
Allstate Group	3.92%
Pilot	2.81%
General Accident Assurance	2.81%
Guardian	2.35%
Commercial Union Assurance	2.30%
Travellers Canada Group	2.29%
Gore Mutual	2.18%
Hartford Fire	2.00%

<u>Company/Group - 1974</u>	<u>Share of Direct Premiums Written</u>
Wellington	1.99%
Wawanesa	1.93%
Lumbermens Mutual	1.74%
Canadian General Group	1.65%
Home	1.50%
Lloyd's	1.26%

(Source: Superintendent of Insurance of Ontario. Annual Report. - Toronto, 1986.)

Concentration and Market Shares: 1974 to 1984

Figure 4 (page 248) presents the market shares for automobile insurance in Ontario of the top 20 groups for 1974, 1979 and 1984. Figure 5 shows some of the turnover in market share rankings from 1974 to 1984.

FIGURE 5

Turnover of Rankings by Market Share

<u>Company/Group</u>	<u>Ranking by Market Share</u>		
	1984	1979	1974
Co-Operators General	1	2	1
State Farm Auto	2	4	4
Royal Insurance Group	3	1	2
Economical Group	4	7	5
Pilot	5	12	8
Allstate Insurance Group	6	5	7
General Accident Assurance	7	11	9
Zurich	8	8	6
Dominion Group	9	6	3
Safeco Group	10	25	26
Commercial Union	11	9	11
Home	12	21	19
Phoenix Continental Group	13	13	30
Firemans Fund of Canada	14	10	29
Travellers Group	15	14	12
Wawanesa	16	17	16

<u>Company/Group</u>	<u>Ranking by Market Share</u>		
	1984	1979	1974
Scottish & York	17	20	27
Simcoe Erie Group	18	41	59
Canadian General Group	19	3	18
Gore Mutual	20	15	13

(Source: Superintendent of Insurance for Ontario. Annual Report. - Toronto, 1986.)

The data in Figure 5 indicate that there was some stability in rank by market share among the industry leaders between 1974 and 1984. For example, of the top 10 firms in 1984, 7 were in the top 10 in 1979 and 9 were in the top 10 in 1974. The group comprised of the 11th to 20th largest firms showed slightly more variability. Of the 11th to 20th largest in 1984, 5 were in this group in 1979 and 6 were in this group in 1974. Furthermore, three companies or groups, Co-operators General Insurance, State Farm Auto and the Royal Insurance Group, were consistently among the top four companies in each of 1974, 1979 and 1984. Of course, there were exceptions to the general pattern of stability over 1974 to 1984. The Canadian General Insurance Group's rank rose from 18 in 1974 to 3 in 1979, only to fall back to 19 in 1984. In addition, the Simcoe and Erie Group's rank increased from 59 in 1974 to 18 in 1979. Nevertheless, the information in Figure 5 suggests that companies that were large in 1974 tended to be large in 1984.

A more formal test of these propositions regarding the evolution of market shares between 1974 and 1984 is a regression of 1984 market share on 1974 market share for each company. Linear regression is simply a technique for plotting a line through a scatter of points. The particular line is chosen in order to minimize some criterion function, in this case the sum of the squared deviations between the actual data points and the line itself. The form of the regression equation is simply:

$$Y = A + B \cdot X$$

where Y is the variable to be explained (the dependent variable) and X is the variable on which Y depends (the independent variable). Figure 6 reports ordinary least

squares parameter estimates for the regressions:

$$\text{SOM}(i,1984) = A + B*\text{SOM}(i,1974)$$

and

$$\text{SOM}(i,1984) = A + B*\text{SOM}(i,1979)$$

where $\text{SOM}(i,19xx)$ is the market share as measured by direct premiums written for firm i in year $19xx$, and the parameters A and B are constants to be estimated.

The magnitude of the estimate of B gives us information about the evolution of market share across firm sizes. For example, if the value of B is 1.0, then on average the market shares for all companies in the second period are equal to the market shares in the first period. Since this is a statistical relationship, a value of 1.0 for B does not mean that market shares are equal in the two periods for each company, simply that on average the shares are equal. The R-squared statistic reports the closeness of the linear approximation. An R-squared of 1.0 implies a perfect fit of the regression line to the data, while an R-squared of 0.0 means that there is no linear relationship between the dependent and independent variables. Appendix 1 proves that if B equals 1.0, then the large firms maintained their market share. Similarly, if B is greater than 1.0, the large firms of the initial period increased their market shares, while if B is less than 1.0 it implies that large firms lost market shares over the period (this result is due to G. Quirin et al., Competition, Economic Efficiency and Profitability in the Canadian Property and Casualty Insurance Industry. - Toronto, 1974).

FIGURE 6

Evolution of Market Share, 1974 to 1984

Regression: $\text{SOM}(1984,i)=A+B*\text{SOM}(1979,i)$

$A=0.23$

$B=0.69$

$R\text{-squared} = .79$

Regression: $SOM(1984,i) = A + B * SOM(1974,i)$

$A = -.01$

$B = .98$

$R\text{-squared} = .80$

The regression results suggest that between 1974 and 1984, large firms maintained their relative positions since the estimate of B for that period is close to 1.0. Similarly, between 1979 and 1984, the large firms of the initial period lost market shares, since the estimate of B for that period is 0.69.

Lorenz curves for 1974, 1979 and 1984 reported in Figure 7 provide a graphical summary of the distribution of market shares over the period. In general, the extent of inequality among firms' market shares increased between 1974 and 1979, as the Lorenz curve shifted further away from the 45 degree equality line. Between 1979 and 1984, the curve shifted in the direction of more equality among firms.

While the top 20 firms in the industry accounted for no less than two thirds of direct premiums written in any year from 1974 to 1984, market share rankings for firms in that group provide only a partial description of the industry's structure. The concentration ratios in Figures 8 to 12 reveal some significant trends in the evolution of the structure of the Ontario automobile insurance market, while Figure 13 provides concentration ratios for other industries for the purpose of comparison.

FIGURE 7
LORENZ CURVES

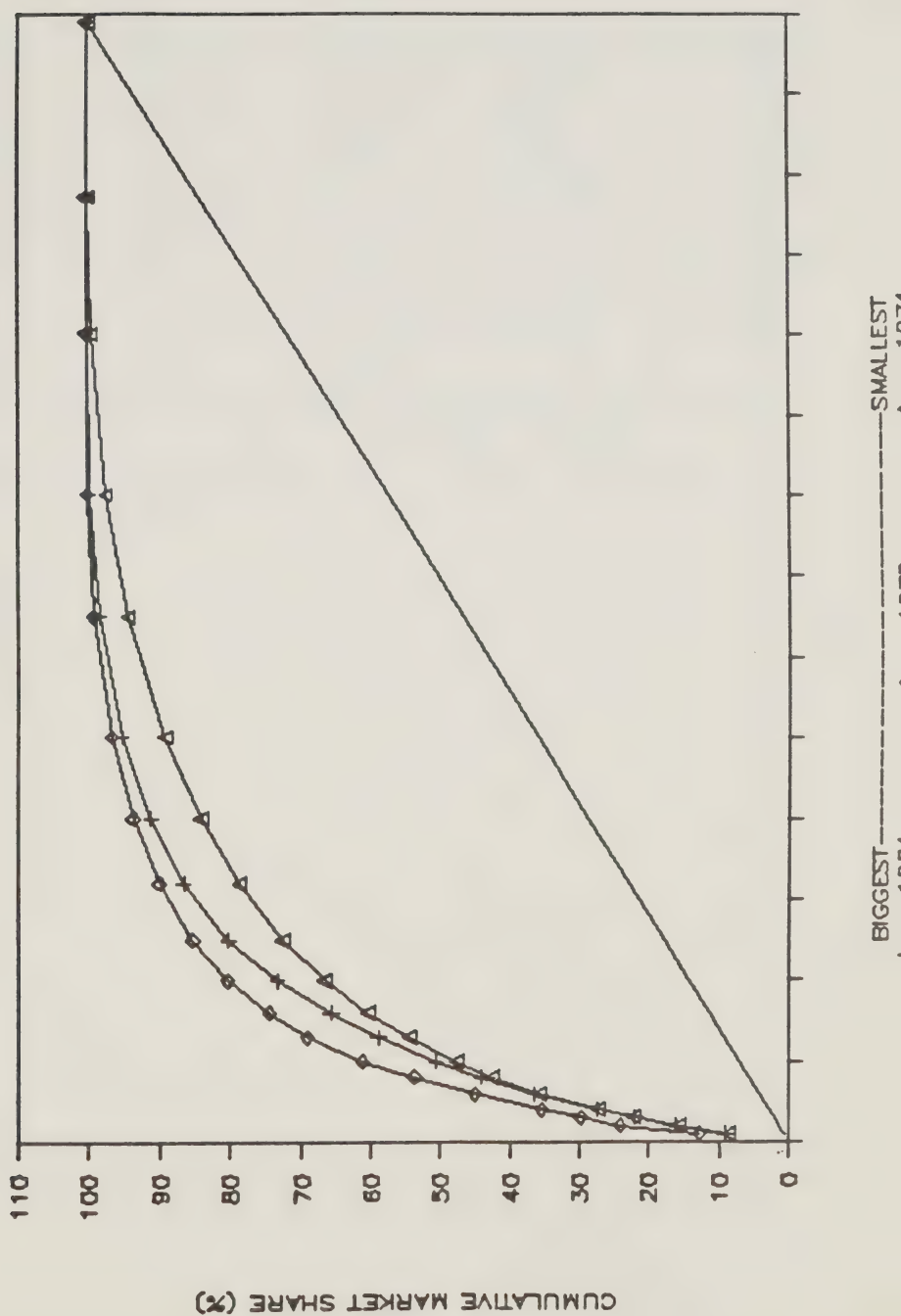


FIGURE 8**Concentration Ratios for Ontario Automobile Insurance**

	C4	C8	C20	H
1974	27.43	42.59	66.59	0.03248
1975	28.90	44.28	67.62	0.03509
1976	30.46	47.86	71.88	0.03944
1977	33.90	51.21	75.17	0.04657
1978	36.66	54.21	79.81	0.05426
1979	36.89	55.79	83.48	0.05589
1980	33.32	51.39	77.89	0.04745
1981	31.10	48.34	75.32	0.04242
1982	27.57	44.51	71.80	0.03713
1983	27.94	44.84	73.95	0.03751
1984	27.82	44.53	73.95	0.03702

(Source: Superintendent of Insurance for Ontario. Annual Reports, 1974-1984).

FIGURE 9

C4 TREND

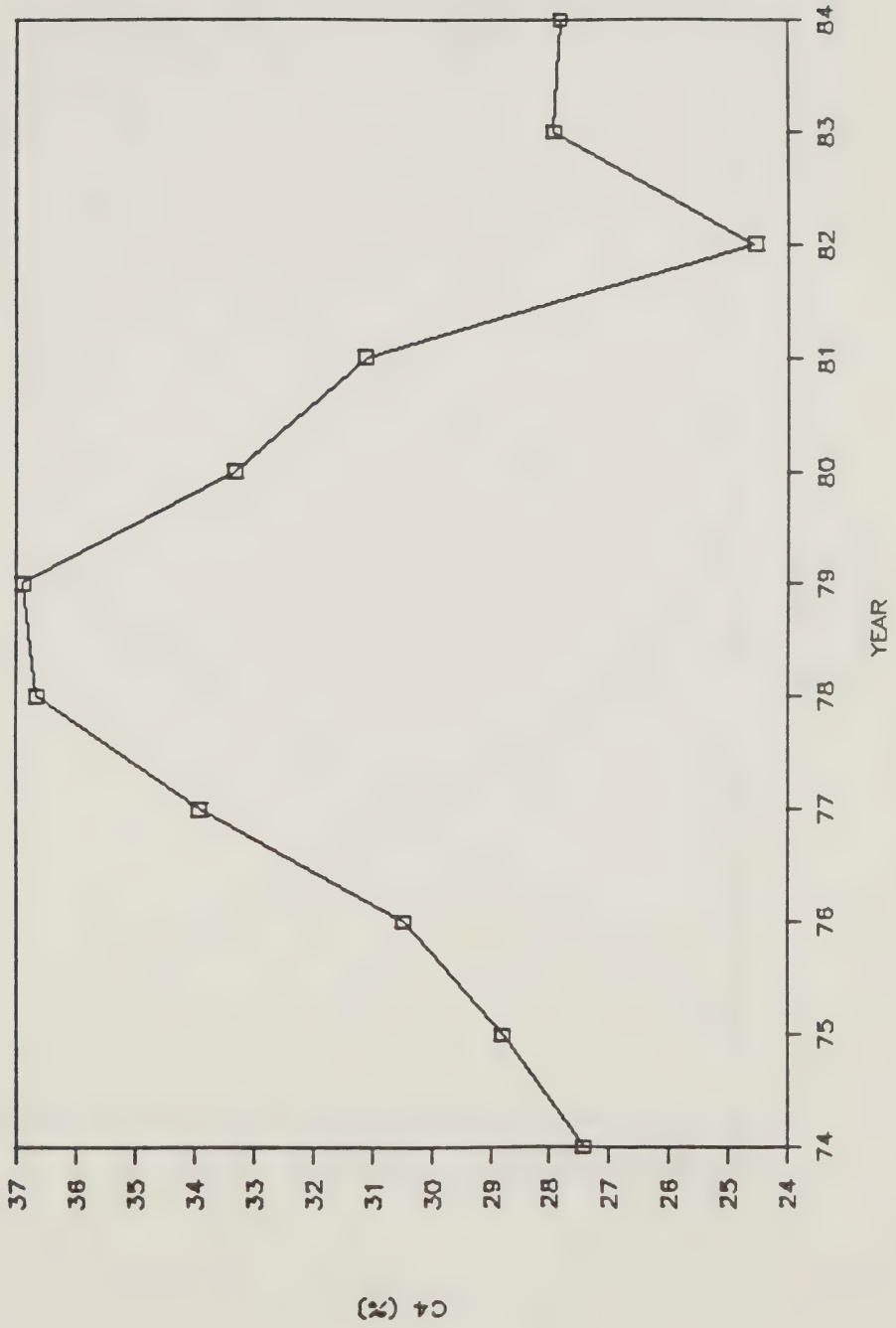


FIGURE 10

C8 TREND

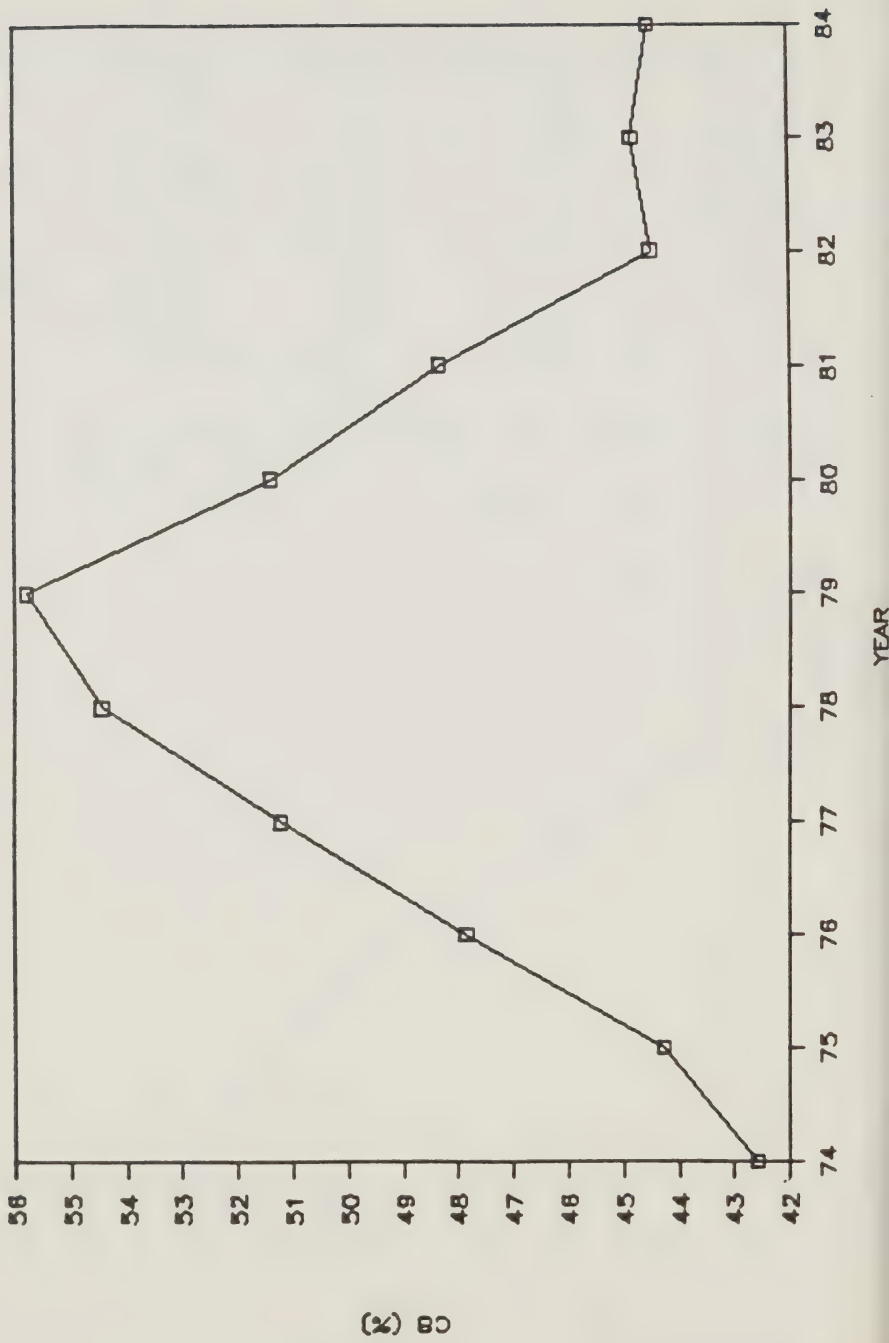


FIGURE 11
C20 TREND

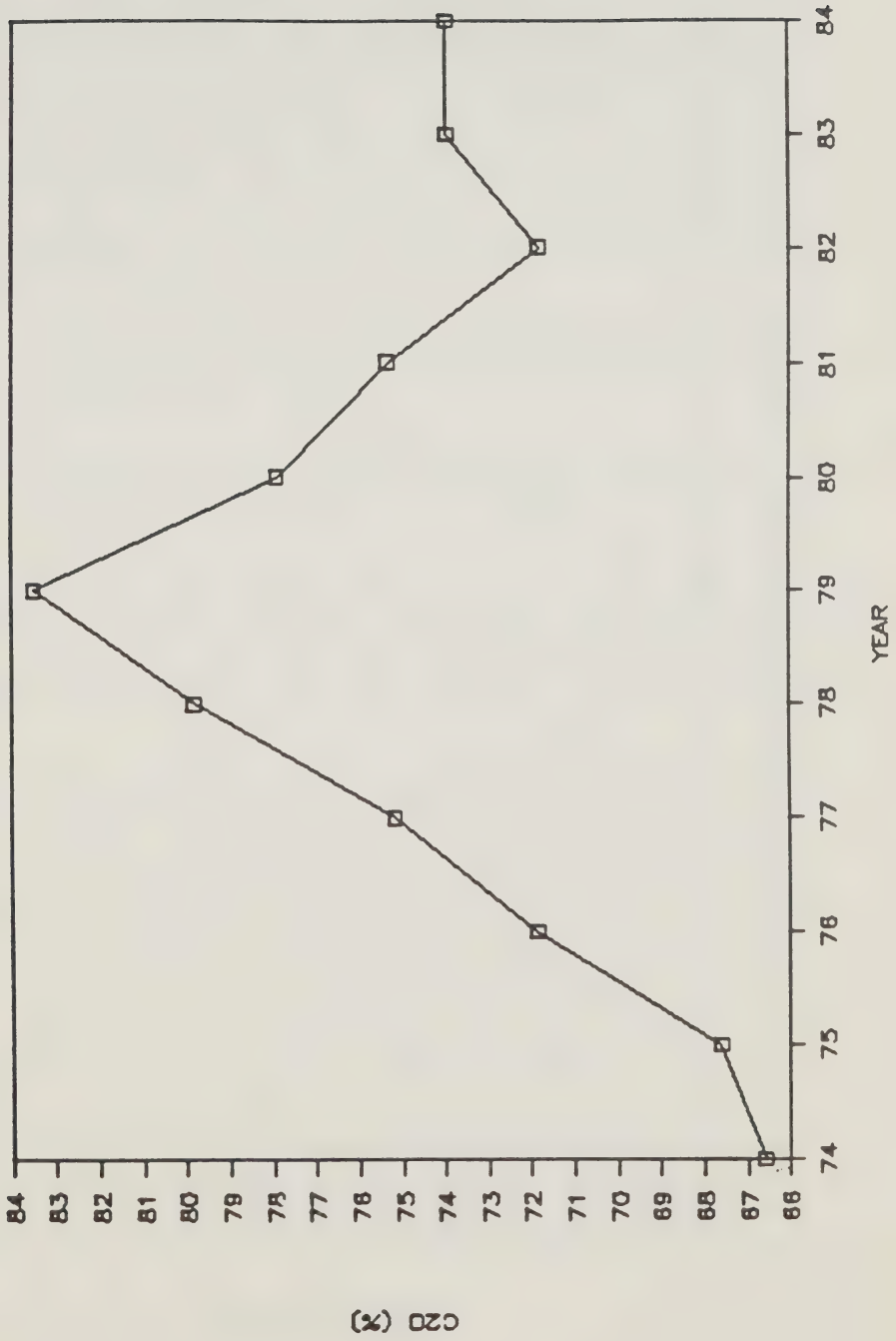
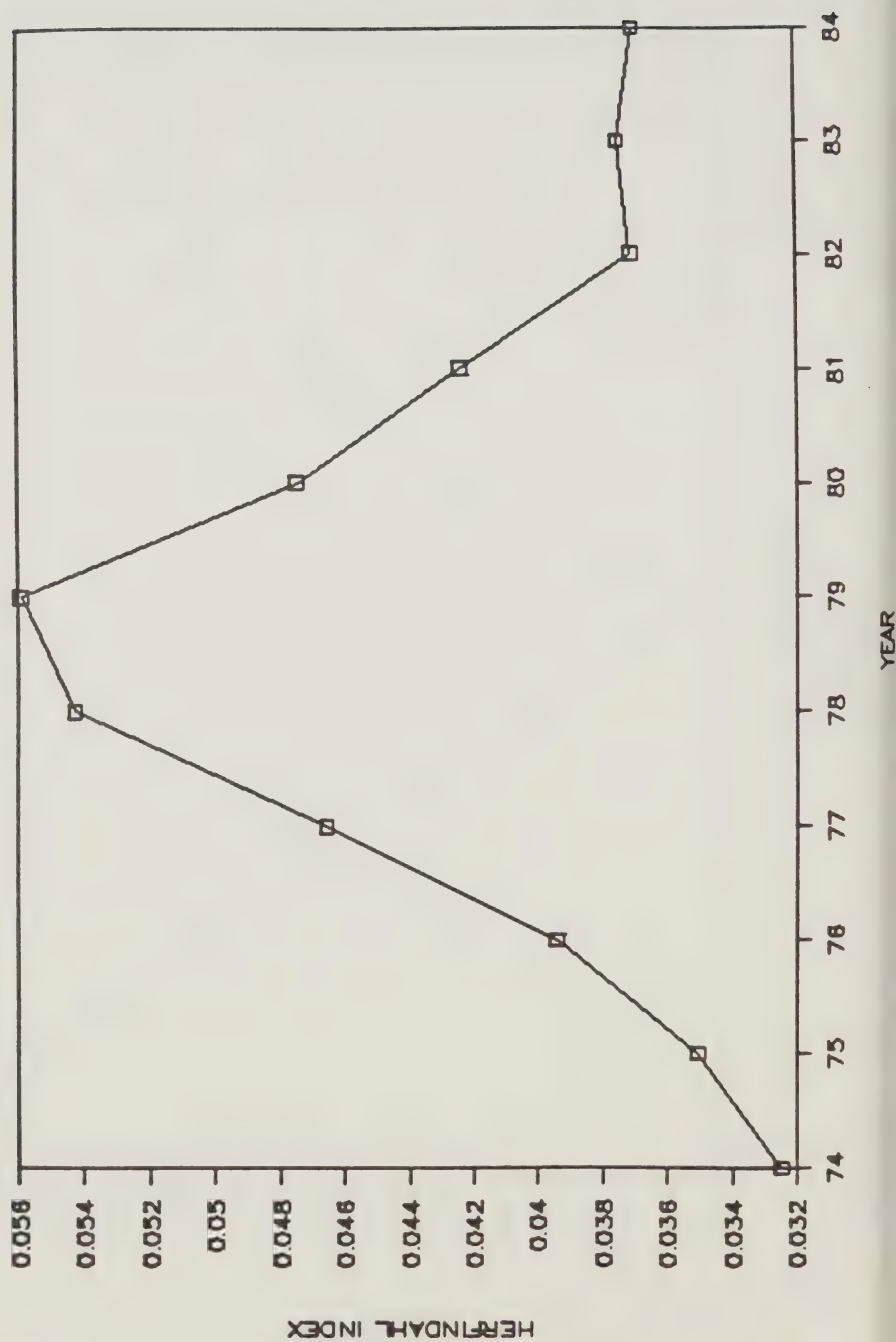


FIGURE 12
HERFINDAHL INDEX TREND



According to all four measures of concentration - C4, C8, C20 and H - concentration rose sharply from 1974 to 1979, fell just as rapidly between 1979 and 1982 and stabilized in 1983. For example, C4 peaked 36.89% in 1979, declined to 24.57% in 1982 and increased to 27.82% by 1984. The other measures of concentration behaved in the same way. Of course, these numbers are really only meaningful when measured against some yardstick. For example, the Herfindahl index decreases with increases in the number of firms in the industry and increases with rising inequality among a given number of firms. Furthermore, the Herfindahl index has a value of 1.0 for a monopolistic industry and approaches 0.0 for a perfectly competitive one. Therefore, the Herfindahl index for Ontario automobile insurance shows that:

- i) the industry comes close to having a perfectly competitive structure, since $H < 0.06$ over 1974 to 1984; and
- ii) inequality among firms in terms of market share increased between 1974 and 1979, and declined between 1979 and 1984.

In general, the concentration ratios show that the automobile insurance industry had roughly the same structure in 1984 as it did in 1974, and that that structure was approximated best by the model of perfect competition.

Figure 13 presents national concentration ratios for selected industries in order to facilitate comparison with the real world, as opposed to theoretical, market structures. Since we are comparing a provincial industry with national industries, it is important to recall the fact that a given industry will usually appear more concentrated as the relevant geographical scope narrows. For example, Canada has many newspapers, while Toronto has but three. However, even taking this bias into account, the Ontario automobile insurance industry appears quite competitive. In particular, 1984 values for C4, C8, C20 and H were lower for the Ontario automobile insurance industry than for the unweighted average of the sample of Canadian industries. In conclusion, the Ontario automobile insurance industry has a competitive market structure. Furthermore, the structure of the auto insurance industry was

competitive in 1984 as it was in 1974, and more so than in 1979.

FIGURE 13

Concentration Ratios for Selected Canadian Industries
1980 (except as indicated)

	C4	C8	C20	H
Banking (Assets, 1987)	72.9	91.2	NA	NA
Banking (Loans, 1987)	72.8	92.3	NA	NA
Dairy Products	37.0	50.6	72.7	0.053
Misc. Pharmaceuticals & Resins	27.1	41.5	69.4	0.0361
Childrens' Clothing	21.0	31.9	52.6	0.0221
Pulp & Paper Mills	30.9	49.0	79.3	0.0424
Publishing	40.6	51.1	66.3	0.0541
Iron Foundries	37.8	52.4	75.6	0.065
Machine Shops	6.4	11.8	22.1	0.0042
Motor Vehicle Mfrs.	93.7	98.0	100.0	0.3865
Logging	21.4	33.6	54.6	0.0219
Flour & Breakfast Cereal Mfrs.	66.0	84.7	99.4	0.1261
Rubber Products	56.6	77.2	89.1	0.1087
Plastics Fabricating	10.1	16.6	31.2	0.0079
Boatbuilding	22.4	30.9	48.5	0.0229
Mfrs. of Major Applicances	77.0	90.0	98.3	0.1751
Paint & Varnish Mfrs.	32.6	53.1	78.3	0.0464
Jewellery & Silverware	53.2	60.9	73.8	0.099
Tobacco Products Industry	99.6	100.0	100.0	0.3364
Fish Products Industry	44.7	53.5	67.5	0.0731
Leather Glove Factories	42.0	65.8	96.2	0.0697
Carpet and Rug Mfrs.	48.4	70.0	99.1	0.0835
Average:	43.4	56.3	74.7	0.0918

(Source: Banking: The Canadian Bankers' Association.
Financial Statistics, 1987: Second Quarter.

Other: Statistics Canada. Industrial Organization and Concentration in Manufacturing, Mining and Logging Industries. - Ottawa, 1980.)

Market Structure in Reinsurance

The structure of the Canadian auto reinsurance industry is more concentrated than that of the auto insurance industry, however, the reinsurance market still appears to be competitive. In 1986, 38 firms accepted automobile reinsurance in Canada. Figure 14 presents concentration ratios for automobile reinsurance based on net automobile premiums written.

FIGURE 14

Concentration in Canadian Automobile Reinsurance, 1986

C4	46.89
C8	67.59
C20	92.65
H	0.0805

(Source: Canadian Insurance/Agent and Broker Statistics, 1987.)

The value of the Herfindahl index for the automobile reinsurance market is close enough to 0.0, the perfectly competitive benchmark, to support the hypothesis that anti-competitive conduct by reinsurers would be extremely difficult to organize and maintain.

While non-comparable data sets do not allow us to determine net premiums earned in Ontario automobile insurance we can use national automobile insurance data to infer the extent to which small firms were more likely to cede insurance to reinsurers than large firms. In particular, we regress reinsurance ceded on direct premiums written for a sample of 59 companies, dividing both sides of the equation by assets to correct for heteroskedasticity. For the model:

$$RE = a + b \times DPW$$

where RE is reinsurance ceded, DPW is direct premiums written, and a and b are constants, we have reinsurance as a fraction of direct premiums written as:

$$\frac{RE}{DPW} = \frac{a}{DPW} + b.$$

If a is equal to zero, then on average, firms reinsure a constant fraction of direct premiums written. However, if it is greater than zero, then small firms reinsure a higher proportion of direct premiums written than large firms. Figure 15 presents parameter estimates for this regression. For both specifications, we find that the value of the constant terms, a and c , are not significantly different from zero, because the standard errors of these coefficients are large with respect to the magnitudes of the coefficient estimates. On average, all size classes of automobile insurance companies ceded roughly 33% of direct premiums written to reinsurers.

FIGURE 15

Automobile Reinsurance as a Function
of Direct Premiums Written

Model 1) $RE = a + b \times DPW + e$

Model 2) $\frac{RE}{Assets} = \frac{C}{Assets} + d \times \frac{DPW}{Assets} + u$

<u>Parameter</u>	<u>Estimate</u>	<u>Standard Error</u>
a	-1762	5859
b	0.327	0.0414
c	0.0364	0.0730
d	0.0340	0.0570

R-squared: Model 1) .5150
Model 2) .3726

Sub-Markets for Automobile Insurance

The market share and concentration statistics reported in the previous section are for automobile insurance as a whole, and therefore overstate the degree of competition in the industry. This is because drivers in certain groups do not really have access to all of the companies writing insurance in the province. In particular, the

operators of motorcycles, long haul trucks (particularly to United States destinations), public buses, funeral hearses, ambulances and taxicabs face a restricted choice among insurers, as do high risk category private passenger vehicle operators. Given the limited available data, we could only speculate about concentration in these sub-markets, however, we do have public data on the fractions of these groups insured by the Facility Association. The Facility Association is "an unincorporated non-profit association of insurers ... which provides automobile insurance for owners and operators of motor vehicles who may otherwise have difficulty obtaining such insurance." (Facility Association, Presentation to Task Force on Insurance in Ontario, Toronto, February 1986, from "Notes to Financial Statements"). If a substantial proportion of a particular group insures through the Facility Association, we can tentatively conclude that that group faces a restricted menu of voluntary insurers, since Facility Association clients are usually unable to obtain insurance from any other carrier. Figure 16 reports the Facility Association share of selected Ontario sub-markets.

FIGURE 16

Facility Association Share of Selected Ontario Sub-Markets

(Percent)

<u>By Vehicles Insured</u>	<u>1982</u>	<u>1984</u>	<u>1986</u>
Private Passenger	2.0	1.9	1.7
Farmers	0.5	0.9	0.8
Motorcycles	22.9	20.6	21.6
Snow Vehicles	2.7	8.3	7.2
Commercial	1.9	2.3	3.5

<u>By Premium</u>	<u>1982</u>	<u>1984</u>	<u>1986</u>
Interurban Trucking	5.9	6.2	23.5
Taxicabs	10.8	19.2	46.0
Public Buses	1.7	2.6	15.1
School and Hotel Buses	2.4	2.5	2.3
Funeral and Ambulances	2.6	0.3	10.1
Miscellaneous Public	0.1	2.7	7.8
Garage	1.9	3.8	7.6

(Source: Facility Association)

These statistics highlight potential problems concerning the availability of insurance for taxicabs, interurban trucking, public buses and motorcycles. Furthermore, recourse to the Facility Association has grown dramatically for taxicabs, interurban trucking and public buses between 1982 and 1986. Since these groups appear to belong to very different insurance markets than private passenger vehicles, it is not clear that the high degree of consumer choice and potential competition indicated for Ontario automobile insurance as a whole by the market share and concentration data can be inferred for these sub-markets. Our conclusions about the degree of competition in the industry will be subject to these potential exceptions.

Cost Conditions in Insurance

The cost structure of the automobile insurance industry is important because it has implications for the degree of competition in that industry as well as for the socially optimum industry structure. For example, the presence of scale economies, a situation where for a given range of output, average cost exceeds marginal cost resulting in declining average cost as output rises, creates a barrier to the entry of relatively small companies. Furthermore, if scale economies exist over the entire relevant output range, then the most cost-efficient vehicle for providing services is a regulated monopoly, either privately owned (e.g., Bell Canada) or a Crown Corporation (e.g., Ontario Hydro).

Measurement of cost conditions in the Ontario automobile insurance industry is complicated by two factors. First, we do not have data on output, the number of poli-

cies written. In fact, since automobile insurance policies are not directly comparable, it is not clear that this data would be particularly informative. Second, most insurance companies write multiple lines of insurance as shown in Figure 17.

FIGURE 17

Fraction of Groups Writing Multiple
Lines of Insurance, 1985

<u>Lines Written</u>	<u>Percentage of Groups</u>			
	<u>Canadian</u>	<u>British</u>	<u>Other</u>	<u>Combined</u>
Auto, Personal and Commercial	82.2	75.0	73.8	78.1
Auto and Personal	16.4	16.7	21.3	18.5
Auto and Commercial				
Auto only	1.4	8.3	4.9	3.4

(Source: Federal Superintendent of Insurance, Report, 1986.)

Since most groups write multiple lines of insurance, it is reasonable to conclude that there is some cost advantage from so doing. For the purposes of this study, the implication is that costs incurred in underwriting one line of insurance may depend on activity in other lines. Consider a situation where a given amount of insurance in two lines, x and y , is to be written. Suppose firm A writes both lines at a total cost of TC_A . One alternative is to have separate firms write the insurance in each line. In particular, let firm B write the given amount in line x , at a total cost of TC_B , and firm C write the given amount in line y , at a total cost of TC_C . If $TC_A < TC_B + TC_C$, then it is cheaper to combine the two lines in one firm. Economists characterize this situation as exhibiting "economies of scope". In general, economies of scope arise when producing several different commodities required shared inputs. Cost allocation in this case is difficult. For example, both passenger and freight trains

share the same track, and the cost savings arising from eliminating the duplication of that track are obvious. However, determining the correct cost share of each activity is probably impossible. Our problem is therefore to disentangle the effects of economies of scale and economies of scope in a situation where we can only proxy for output.

Several results from the theoretical literature are useful here (this material is from R. Willig, "Multi-product Technology and Market Structure," American Economic Review, May 1979, pp. 346-351). For the case of products, 1 and 2, produced in quantities q_1 and q_2 respectively, let $c(q_1, q_2)$ be the total cost of producing q_1 and q_2 , $C(q_1, 0)$ be the total cost of producing only q_1 and $C(0, q_2)$ be the total cost of producing only q_2 . The degree of economies of scope D , is given by:

$$D = \frac{C(q_1, 0) + C(0, q_2) - C(q_1, q_2)}{C(q_1, q_2)}$$

D is simply the ratio of the cost savings from combining the two activities in one firm to the total cost of producing both goods in one firm. In order to measure the degree of product specific returns to scale, consider first the incremental cost of a product line. Clearly, this is just the extra cost of adding the production of that line to the other outputs of the firm.

Continuing our notation, the average incremental cost of product 1 is:

$$AIC(q) = \frac{C(q_1, q_2) - C(0, q_2)}{q_1}$$

The degree of product specific returns to scale for product 1 is therefore:

$$S = \frac{AIC_1(q)}{C_1(q)}$$

where $C_1(q)$ is product 1's marginal cost. This is simply a way of determining whether average cost declines as the

output of a particular product rises in a situation where there are economies of scope. If average cost is greater than marginal cost, then the production of one more unit causes average cost to decline, and economies of scale are present. Therefore, in the multiproduct case, there are product specific economies of scale when $s_i > 1$, diseconomies when $s_i < 1$ and constant returns to scale when $s_i = 1$.

In order to model insurance industry costs, we use a specification which allows us to separate out scale and scope effects. This specification does not allow for interaction effects, which means that it does not allow for the possibility that marginal cost in one line of insurance depends on other lines; however, aside from this restriction, the model is capable of describing any type of cost function. In particular, we specify total cost (TC) as:

$$TC = f + g \text{ NPE}_A + h \text{ NPE}_A^2 + j \text{ NPE}_P + k \text{ NPE}_P^2 + l \text{ NPE}_C + m \text{ NPE}_C^2$$

where f-m are constants whose values are to be estimated, NPE_A is net premiums earned in automobile underwriting, NPE_P net premiums earned in personal lines and NPE_C net premiums earned in commercial lines. Since we do not observe the number of policies written, we are forced to use data on net premiums earned. This changes the precise interpretation of our results, but does not bias our conclusions, so long as we are willing to accept the hypothesis that an individual firm's price setting power is minimal. For price-taking firms, our calculated marginal cost is true marginal cost divided by the market price, while calculated average cost is true average cost divided by price. Therefore, these models are capable of correctly testing for declining average cost over a particular output range. For this model:

$$\text{Marginal cost (auto)} \quad g + 2h \text{ NPE}_A$$

$$D_A \quad \frac{f}{TC}$$

$$AIC_A \quad g + h \text{ NPE}_A$$

$$g + h \text{ NPE}$$

$$S_A \quad \frac{A}{g + 2h \text{ NPE}_A}$$

The interpretation of these results is straightforward. If the estimate of parameter f is positive, significant and greater than zero, then there are economies of scope. If the estimate of parameter h is significantly less than zero, then there are scale economies in writing automobile insurance.

The regression model we use to fit the parameters through m relies on a number of restrictions in order to produce best linear unbiased estimates with meaningful test statistics (measurements of the significance of those estimates). An important assumption required by our ordinary least squares method is that the variance of the errors in the above regression be independent of the explanatory variables in that equation. There is some evidence that this assumption is violated. In statistical terms, the model suffers from heteroskedasticity. When heteroskedasticity is present, ordinary least squares estimation places more weight on the observations with large error variances than on those with small error variances. The fitted regression line will guarantee a very good approximation in the large variance position of the data. Due to this implicit weighting, ordinary least squares parameter estimates will be inefficient, which means that the variances of the estimated parameters are not the minimum variances. Since we use these variances to construct t -tests for the significance of individual parameters, heteroskedasticity will bias our tests in favour of rejecting the significance of a given parameter. However, parameter estimates will still equal the values of the true parameters. To correct for heteroskedasticity, we use the technique of weighted least squares, which simply divides through each side of the regression equation by some variable related to the variance of the error. In this case, dividing through by total assets solves the problem. Figure 18 presents the results of regression for the model while Figures 19 and 20 plot the errors of these regressions against the independent variables. Data are for 64 firms for the year 1985 (source: Federal Superintendent of Insurance. Report, 1986). Our unit of measurement is thousands of dollars.

To test for economies of scope, we examine the null hypothesis that $f=0$, while the test for economies of scale considers the null hypothesis that $h=0$. The appropriate

statistic for this type of hypothesis is simply the t-statistic:

$$t = \frac{\text{parameter estimate.}}{\text{standard error}}$$

For the result of the heteroskedasticity adjusted model, we have:

$$t_f = -0.302.$$

$$t_h = 0.230.$$

Even at the 25% significance level, $t=.677$ (approximately) for this sample size. Hence, we cannot reject the null hypotheses that $f=0$, $h=0$. This implies that we cannot reject the hypothesis that insurance underwriting is not subject to economies of scope, or the hypothesis that auto insurance underwriting is not subject to economies of scale. In other words, we find that in auto insurance underwriting, small firms are not, on average, at a cost disadvantage vis-a-vis large firms.

FIGURE 18Scale Economies Regressions

$$\text{Model: } TC = f + gNPE_A + hNPE_A^2 + jNPE_P + kNPE_P^2 + lNPE_C + mNPE_C^2 + v$$

<u>Parameter</u>	<u>Value</u>	<u>Standard Error</u>
f	4,601	3,416
g	1.1478	.2001
h	8.762×10^{-7}	6.978×10^{-7}
j	1.7761	.5723
k	-1.102×10^{-5}	6.237×10^{-6}
l	1.0280	.4435
m	1.918×10^{-5}	7.677×10^{-4}

$$\text{Sample Size} = 64$$

$$\text{Corrected } R^2 = .9764$$

$$F = 435.37$$

Model Adjusted:

$$\begin{aligned} \frac{TC}{\text{Assets}} = & \frac{f}{\text{Assets}} + g^* \frac{NPE_A}{\text{Assets}} + h^* \frac{NPE_A^2}{\text{Assets}} + j^* \frac{NPE_P}{\text{Assets}} \\ & + k^* \frac{NPE_P^2}{\text{Assets}} + l^* \frac{NPE_C}{\text{Assets}} + m^* \frac{NPE_C^2}{\text{Assets}} + v \end{aligned}$$

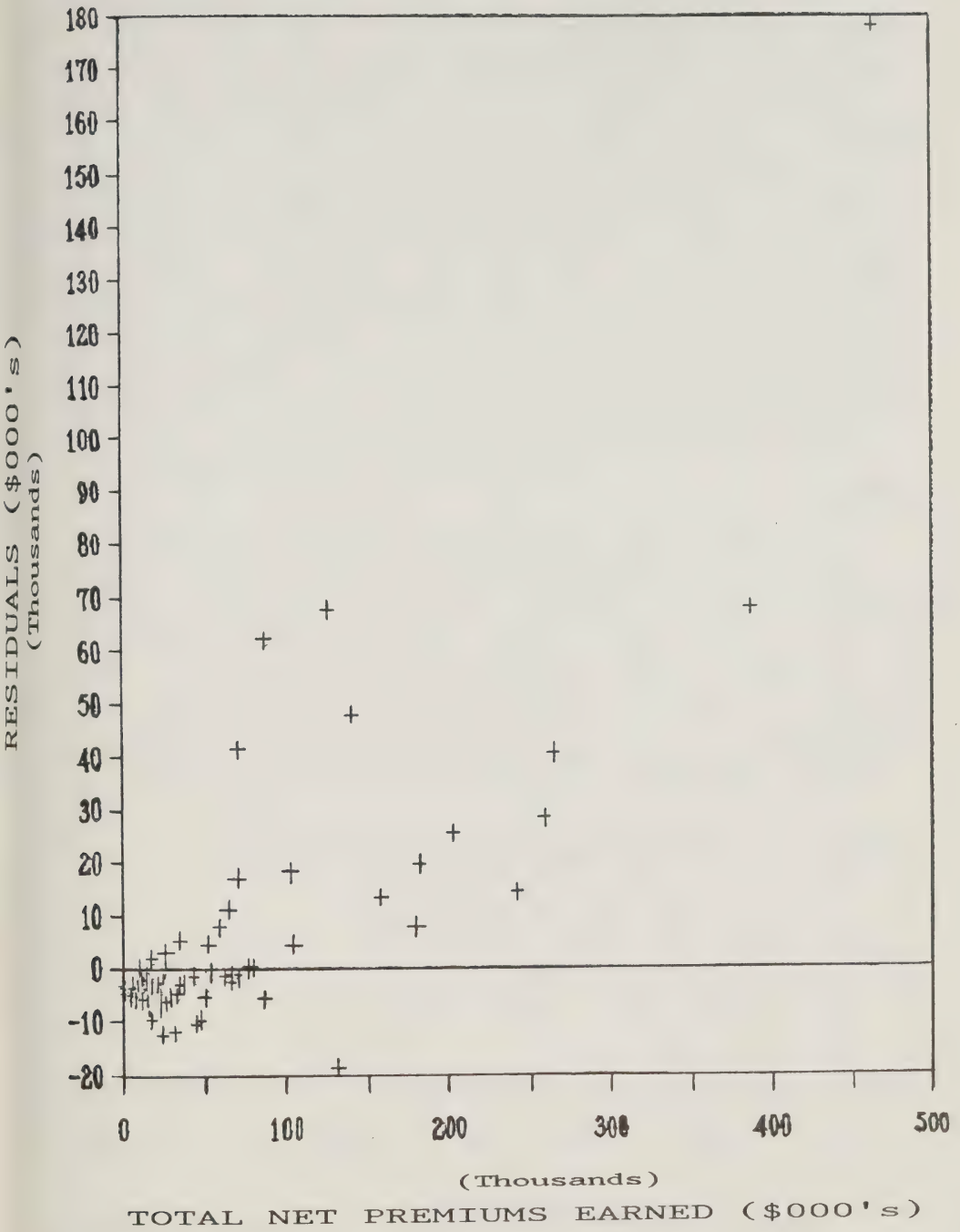
<u>Parameter</u>	<u>Value</u>	<u>Standard Error</u>
f	-99.25	328.2
g	1.219	.08434
h	3.542×10^{-7}	1.538×10^{-6}
j	1.434	.02382
k	-9.193×10^{-6}	1.281×10^{-5}
l	1.179	.03726
m	1.545×10^{-5}	2.040×10^{-6}

$$\text{Sample Size} = 64$$

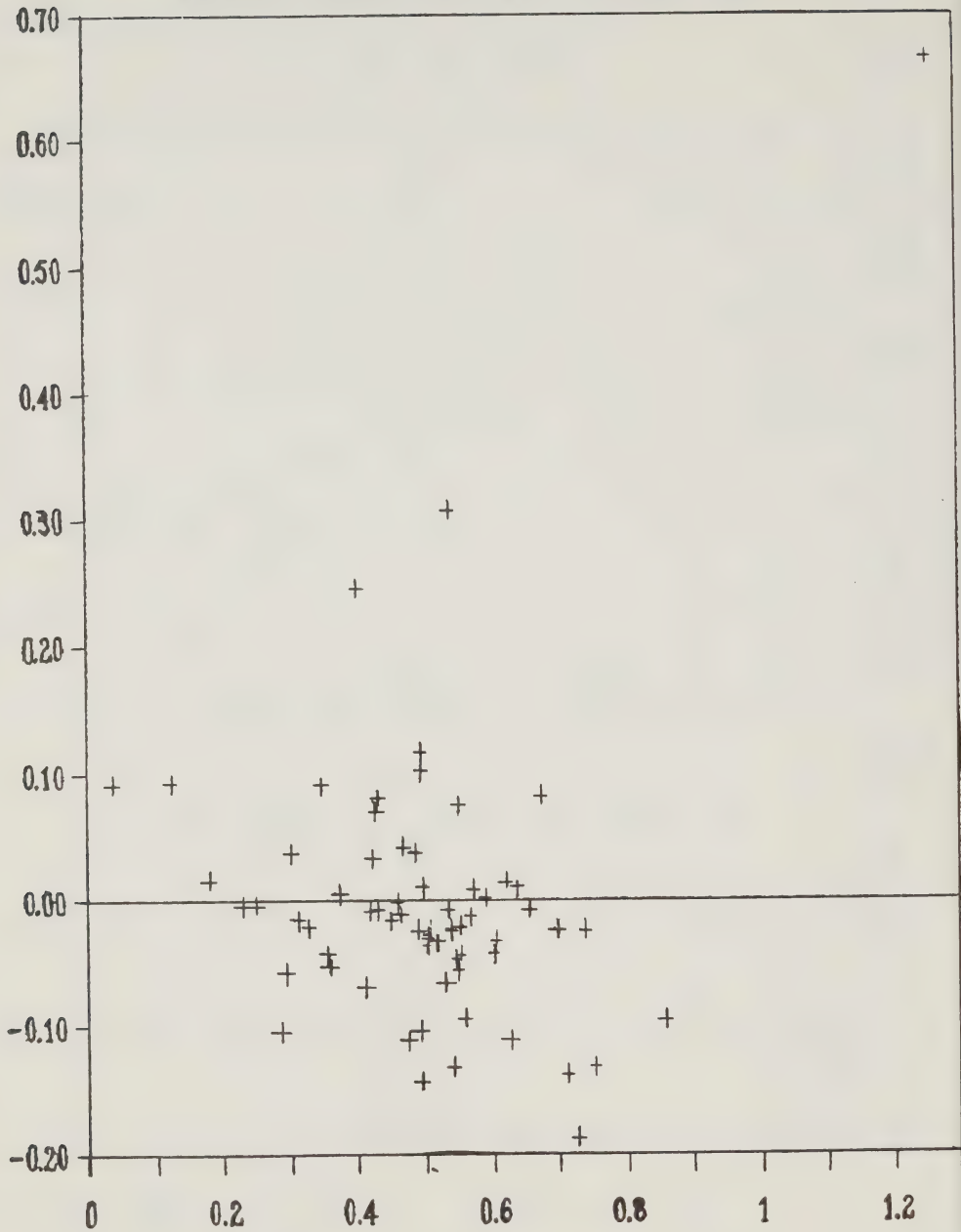
$$\text{Corrected } R^2 = .9899$$

$$F = 684.37$$

RESIDUALS VS NPE



RESIDUALS VS NPE/ASSETS

FIGURE 20
RESIDUALS

TOTAL NET PREMIUMS EARNED/ASSETS

Other Entry Barriers

Absent any cost or product differentiation-based barriers to entry, government regulation may serve to inhibit entry into the insurance industry by conferring advantages on incumbent firms, or simply making entry more costly than necessary. Insurance underwriters are required by the provincial Insurance Act to maintain total capital and surplus of at least \$1,000,000 or more at the discretion of the Minister of Consumer and Commercial Relations. Of this amount, \$500,000 must be paid in capital, while \$250,000 must be unimpaired surplus. Underwriters must also deposit approved securities with the Minister worth \$25,000 if they operate in the Ontario market only, and \$50,000 if they operate in other jurisdictions as well as Ontario. Furthermore, the federal Department of Insurance requires that every \$3.00 of premium written by a company must be supported by \$1.00 of capital.

There is no evidence to suggest that these requirements inhibit entry into the industry. First, these regulations apply equally to incumbent firms and potential entrants. Second, the federal regulation concerning the ratio of premiums to capital has an equal effect on all sizes of company, for it requires larger companies to raise more capital than smaller ones. Finally, the minimum amounts of capital required by the Province seem easily supported by the Canadian capital markets, although this assertion is based on judgment rather than on hard data.

FIGURE 21

Entry and Exit in Ontario Automobile Insurance,
1975 to 1984

Year	Number of Firms	Average DPW,* Current Year	Number of Firms	Average DPW,* Previous Year
1975	5	\$ 295	12	\$ 959
1976	5	680	16	1,212
1977	5	5,706	13	1,723
1978	11	506	6	598
1979	6	107	5	357
1980	8	1,156	9	46
1981	11	1,103	3	2,905
1982	3	4,900	7	2,447
1983	6	650	12	560
1984	7	10	4	121
Average	6.7	1,511	8.7	1,093
Standard Deviation	2.6	2,042	4.4	981
*DPW = Direct Premium Written (\$000) by Group				

(Source: Superintendent of Insurance for Ontario. Annual Reports. - Toronto, 1974 to 1986.)

Entry and Exit in Ontario Automobile Insurance

A more direct test of whether barriers to entry exist in automobile insurance is simply an examination of the entry and exit experience of the industry. Figure 21 gives the number of firms entering and leaving the Ontario industry over the period 1974 to 1984. Entry is defined as the appearance of a group in the Ontario Superintendent's report which did not write any business in the previous year's report. Exit is defined as the disappearance from the report of a group which did write business in the previous year.

The industry's entry and exit experience for 1975 to 1984 shows that companies did not face barriers to entry or exit, since over that period, 67 groups entered while

87 left, producing a net loss of 20 groups. This data suggests that the scale economies under which firms operate have been insufficient to deter entry into the industry. While at the group level, entrants were 38% larger than exiters between 1975 and 1984, the standard deviation of average direct premiums written was over twice as large for entrants as for firms leaving the industry. Furthermore, the relatively small size of the entrants confirms our finding that auto insurance is not characterized by economies of scale.

The Insurers Advisory Organization

The Insurers Advisory Organization (IAO) publishes recommended rates for automobile insurance based on the formula that for every \$1.00 of premium income, \$0.72 should be allocated to claims settlements and increases in reserves, and \$0.28 should be taken up by operating expenses and taxes. There is no mechanism which forces insurance companies to actually charge these recommended rates. The existence of an organization which recommends prices might seem anti-competitive. For example, we do not observe a (hypothetical) Supermarket Advisory Organization publishing recommended prices for food items. However, IAO membership is voluntary, and only approximately half of the companies writing auto insurance in Ontario belong (source: IAO). It is possible that the IAO could facilitate implicit collusion among insurers by giving them a mechanism to coordinate their pricing policies. However, it is unlikely that the IAO serves this function. Even if the industry or a group of firms in the industry attempted to use the IAO to coordinate their prices, there appears to be no industry mechanism for punishing firms which cheat on IAO recommendations. This means that if the IAO were to set its recommended prices above costs so that firms charging IAO prices could earn supernormal profits, it would always pay any firm to discount from those prices. By discounting a little, the cheater would gain market share, thereby increasing its profits. Since all firms would have an incentive to cheat, IAO prices set above costs would not be sustainable. It is therefore unlikely that the IAO facilitates implicit collusion among insurers.

Insurance Brokers and Agents

Automobile insurance companies market their product either directly, using their own agents, or through insurance brokers who sell insurance for several different companies. In effect, insurance brokers retail insurance for the companies, earning an average commission of approximately 11.5% of premium (based on Insurance Bureau of Canada: 1985 Expense Allocation Program, agency and acquisition costs). In Ontario, insurance brokers are governed by the Registered Insurance Brokers Act, which gives the Registered Insurance Brokers of Ontario (RIBO) the power to interpret and administer the rules of the Act. Insurance brokers and brokerage companies are not allowed to be involved in second businesses unless RIBO deems the other business to be appropriate. For example, automobile dealers would be prohibited from offering insurance brokerage services to their clients. Furthermore, part-time employees are not allowed to act as insurance brokers.

Brokerage companies are also subject to regulation. In particular, the majority of a brokerage company's shares must be held by registered insurance intermediaries, although this restriction does not apply to corporations where the proportion of shares not held by registered intermediaries has not increased since October 1, 1981, or corporations which were listed on a Canadian stock exchange prior to October 1, 1981. Firms are required to carry errors and omissions insurance of at least \$500,000 and fidelity of at least \$100,000. Finally, sales promotions by brokers are restricted.

These regulations clearly confer significant economic benefit on insurance brokers. Potential competitors such as trust companies and automobile dealers are prohibited from competing in offering insurance. Part-time employees are also prohibited from competing with full-time brokers. New brokerage firms are prohibited from using promotions to inform the public of their existence. Post-1981 brokerage firms are denied some of the flexibility in raising capital enjoyed by pre-1981 brokerages. The effect of these regulations is to limit the extent of competition in automobile insurance brokerage by restricting entry and constraining the behaviour of entrants. The relevant question for public policy is whether the Province ought to limit competition in the brokerage business.

The usual rationale for allowing self-governing professions to prohibit certain forms of competition is that professional regulations are necessary to ensure quality which, a priori, may be impossible for consumers to measure. For example, a lay person cannot judge the quality of a physician before, and perhaps even after, being treated. One could argue that comparison of that physician's record of success with those of other physicians indicates quality, but this type of policing would come at the expense of allowing incompetent doctors to practise until their reputations forced them out of the market. Along with self-government on quality, professions are usually allowed to restrict competition in ways that would be illegal for most businesses. For example, it would have been impossible for individual doctors to advertise their prices during the period of extra-billing in Ontario.

In effect, the Registered Insurance Brokers Act allows brokers to behave like a self-governing profession rather than an ordinary business. The Act appears to shelter brokerage firms and individual brokers from competition, to their probable economic benefit, and to the potential detriment of consumers.

Conclusions

This study has examined the structure of the Ontario automobile insurance industry using standard results and techniques from the field of industrial economics. We have also briefly examined the insurance brokerage market. Based on our examination of market structure, we conclude that the Ontario automobile insurance industry is competitive, in the sense that economists use the term. We do not find evidence that economies of scale or economies of scope were significant. Furthermore, substantial entry by relatively small firms over the period 1975 to 1984 implies that the industry is not protected by entry barriers. Therefore, we find no structural evidence to support the claim that insurance companies are earning supernormal profits. Indeed, the net exit from the industry over the period 1974 to 1984 suggests that risk adjusted automobile insurance industry profitability may have been sub-normal, in the economic sense of that term. We also conclude that the structure of the automobile reinsurance market is reasonably close to the stylized model of perfect competition. We do find legal barriers to entry in the insurance

brokerage industry, based on some of the provisions of the Registered Insurance Brokers Act. We question whether the entry deterring provisions of the Act are necessary to ensure consumer welfare.

APPENDIX 1: INTERPRETING THE MARKET SHARE REGRESSION

Part of our analysis of changes in market shares over time used regression coefficients to determine whether larger than average firms tended to gain or lose shares. Quirin et al. (1974, pp. 48-49) derive the interpretation for the regression coefficients, which we reproduce here.

We are concerned with the regression:

$$\text{som}(i,t) = A + B * \text{som}(i,t-j),$$

where $\text{som}(i,t-j)$ is the market share of firm i at time t , while A and B are constants. Define $s(i,t)$ as $\text{som}(i,t) - \text{AVG}$, where AVG is the average market share at time t . The ordinary least squares estimator of B , B , is defined as:

$$B = \frac{\sum_{i=1}^N s(i,t) * s(i,t-j)}{\sum_{i=1}^N s(i,t-j)^2}$$

(assuming there are N firms in the industry). Quirin et al. prove that this estimator can be rewritten as:

$$B = 1 + \sum_{i=1}^N \frac{s(i,t-j)^2}{\sum_{i=1}^N s(i,t-j)^2} * \frac{s(i,t) - s(i,t-j)}{s(i,t-j)}$$

squared deviation. Quirin et al. state: "Since there are a large number of firms in the industry, the average [squared deviation] will be small [so that] this factor will weight the impact of the larger companies more heavily. This weight is always positive." The second term will be positive, implying that the estimate of B will be greater than 1.0, when:

- i) $s(i,t-j) > 0$ and $s(i,t) > s(i,t-j)$
- ii) $s(i,t-j) < 0$ and $s(i,t) < s(i,t-j)$.

The first condition says that for a large company, which implies that $s(i,t-j) > 0$, B is greater than 1.0 whenever that firm increased its market share. The second condition says that for a smaller than average company, B is greater than 1.0 whenever that firm's market share declined.

Since the number of firms is large, the weights are much higher for the large firms, which means that we can infer that the change in large firm market shares was approximately one minus the estimated value of B.

HISTORICAL DEVELOPMENT OF
REGULATION IN THE
UNITED STATES

An opinion prepared for the Inquiry Into Motor
Vehicle Accident Compensation in Ontario

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HISTORICAL DEVELOPMENT OF REGULATION IN THE UNITED STATES

As in a number of other forms of economic regulation, Massachusetts appears as the innovator among the United States with an 1818 statute requiring the filing of insurance companies' annual financial statements with the state comptroller.¹ While this constituted a reporting requirement additional to that imposed on other corporations, its basic purpose seems to have been purely fiscal, to permit the determination of liability for state taxes. By 1837, this limited fiscal objective became an attempt to influence economic performance, as companies were required to establish reserves and to maintain a fund which would ensure their ability to carry out their contractual obligations.² The motivating factor in this initiative seems to have been the New York fire of 1835 which destroyed 700 buildings and bankrupted most of the fire insurance companies in business in that state.

Boards of Commissioners of Insurance were established in New Hampshire (1851), Massachusetts (1852) and a number of other states shortly thereafter. These were replaced or supplemented by the establishment of full-time insurance departments in Massachusetts (1855), New York (1860) and elsewhere.³ A legal challenge to this exercise of state regulatory jurisdiction was rejected in 1869 on the ground that it did not interfere with interstate commerce because insurance was not commerce.⁴ The state supervision of insurance was established at about this time only in the more sophisticated jurisdictions; only 17 states had insurance commissioners by 1890 and most of those had settled back to review annual reports and process licence applications. The major concern of regulators was solvency; the Chicago fire of 1871 led to claims in excess of \$100 million and bankrupted 68 of the 302 fire insurance companies involved. A major fire in Boston the next year produced claims of \$50 million and put another 25 insurers out of business. Improved rating systems installed by rating agencies in the wake of these disasters made the fire insurance business profitable by the latter part of the century.⁵

Concern over a variety of dubious practices in the insurance industry led to the appointment, in New York, of the Armstrong Committee, which proposed a variety of reforms in the life insurance industry in 1906, and the Merritt Committee which did the same for the fire and

casualty business in 1911. As a consequence of these proposals, New York regulation was tightened considerably. Because of the importance of New York as a financial centre, as well as because of its importance as an insurance market, most companies had to meet the new New York standards and these became de facto national standards in the decades that followed. New York's enforcement applied to all companies doing business in that state, enabled most states to rely on New York's initiatives in this area so that in many states such rate regulation as existed was often pro forma, and simply accepted the proposals put forward by the rating bureaus involved. Rather more attention was paid to the review and examination of annual financial statements filed with the Commission. These were allocated among Commissioners in the various states for review by a committee of the National Association of Insurance Commissioners.⁶

The depression of the 1930s brought with it a number of complaints about insurance companies and their practices. In particular, questions were raised about the rate-fixing activities of the rating bureaus which had been given a quasi-official status under the Merritt reforms. This in turn led to an antitrust action against the Southeastern Underwriters Association. On an appeal on the question of jurisdiction, the U.S. Supreme Court ruled that insurance was commerce and that federal antitrust statutes applied to the industry.⁷ The industry lobbied intensively to have regulatory jurisdiction returned to the states, and in 1945 the McCarran-Ferguson Act was passed, exempting from federal antitrust laws any company whose rates in a state were effectively regulated by the regulatory authorities of that state.

Substantially all of the states moved to establish state regulation as a consequence of the federal 'threat' and the insistent lobbying efforts of the companies. Current regulatory bodies and the basic thrusts of rate regulation are the outcome of these moves; actual practice has changed, in varying degrees, over the four decades since present regulatory structures were established.

BASIC PROVISIONS FOUND IN INSURANCE REGULATION

Economic regulation of the insurance industry as applied to fire and casualty insurance (including automobile

in the several jurisdictions of North America consists of some or all of the following provisions:

(a) Controls Over Entry

Most jurisdictions require that a company wishing to do business in the jurisdiction be licensed or 'admitted', and prohibit agents from placing business with non-admitted insurers unless the risk has been offered to admitted insurers within the jurisdiction and turned down. The term 'surplus lines' is used to describe such insurance placed with non-admitted companies. A further provision in most jurisdictions restricts the placing of reinsurance with non-admitted insurers by requiring insurers ceding such reinsurance to continue to show full liability for unexpired premiums, etc. on their own financial statements, while requiring expensing of premiums paid to reinsurers. Agents are also subject to state licensing requirements.

In Canada, entry is subject to dual controls by federal and provincial superintendents. Licensing by the former entitles a company to do business within Canada; provincial licensing admits to a single province. Nothing prevents a provincially-licensed company, however, from obtaining provincial licences in a number of provinces, thus avoiding federal jurisdiction. Most have not bothered to do so; federal regulation is regarded as innocuous.

(b) Reporting Requirements

Annual financial statements in an approved form are required to be filed with the regulatory authorities in all jurisdictions. These are required to be computed using specified systems of accounts which depart, in several notable respects, from the Generally Accepted Accounting Principles which apply to most industries. No such principles have yet been established for insurers although the Canadian Institute of Chartered Accountants has moved to accept statement-based accounts.

(c) Loss Experience Reporting

Nearly all jurisdictions require the reporting of claims experience on a claim-by-claim basis, as their existence becomes known, to a designated statistical agency which compiles and reports aggregate loss experience and exposures for its member companies. The basic purpose of reporting is to forecast losses on an exposure-related basis in order to establish premium rates. For accounting purposes, it is also accessory (sic) to estimate Incurred But Not Reported (IBNR) losses; this usually involves use of loss development factors developed by the statistical agency or rating bureau. In most United States jurisdictions, there are two statistical agents which are regional organizations performing the agency function on behalf of stock and mutual companies respectively. Most of these bodies also serve as rating bureaus. In the latter capacity, they perform actuarial analyses of loss experience, project losses and set or recommend rates for their members. Their function is discussed below. In Canada, a single agency, the Insurance Bureau of Canada, performs the statistical agent function but does not act as a rating bureau.

In most of the United States a company may belong to a rating bureau for statistical agency purposes but not for ratemaking purposes.

(d) Financial Examination

Annual statements are examined by insurance commissions staff but are not audited. In the United States, the examination function for a given company is allocated by the National Association of Insurance Commissioners (NAIC) to one of its members. In Canada, this function is performed for federally-licensed companies (i.e., those licensed under the Canadian and British Insurance Act or the Foreign Insurance Companies Act) by the staff of the federal superintendent of insurance, while provincially-licensed companies are inspected by the respective provincial superintendents.

(e) Standardization of Policy Provisions and Terms

This regulatory requirement plays an important role in facilitating competition; it ensures that the formal contract of one company is the same as that of a competitor. It is also important in the actuarial context, since the frequency and severity of losses experienced by one carrier would be quite different from that of another if there were significant differences in their contractual obligations.

This being said, it should also be noted that premature uniformity here can be as stifling to progress as premature standardization anywhere. It is at least likely that the availability of uninsured motorist coverage was delayed in most parts of Canada by the adoption of a standard policy in which it was not provided. Some jurisdictions permit, others do not, the addition of extra coverages beyond those available in the basic policy and its approved variations.

It should also be noted that while the standardization of the contract undoubtedly reduces differences in loss frequency and severity, the claim management practices of individual insurers may increase them. One company may be much faster to accept liability than another and may choose to settle claims another would fight, for marketing-related or other reasons.

Standardization with respect to policy terms goes well beyond the individual jurisdiction level. Both the NAIC and its Canadian counterpart, an association of superintendents, function as uniformity commissioners and recommend standard or 'model' policy terms to their membership. Official policy forms in most jurisdictions adhere closely to the recommended standards.

(f) Rate Regulation

In most U.S. jurisdictions and in four Canadian ones (five, if proposed controls in Ontario are adopted) the actual premium rates charged by companies within the jurisdiction are fixed for at least one type of coverage. In some cases, rates are set for individual companies. Usually, rating bureaus function as agents and propose rates which are set for the membership of the rating bureau as a group. Individual companies may deviate from

the group rates under conditions which are still widely variable from state to state. In general, the terms on which individual companies may deviate from bureau rates have been eased considerably over the past two decades.⁸

(g) Licensing and Regulation of Agents

No insurers of consequence deal directly with new customers. All use an agent as a middleman. The agent interviews the client and helps her/him determine appropriate coverages, taking into account risk exposures and economic circumstances. Almost as important, but not a contractual part of the agent's job, is the provision of good offices to resolve conflicts between the insured and the company when a potential claim situation arises. Most insureds expect their agent to bring pressure on the company for a favourable settlement; most agents perform in this capacity and are assisted in doing so because of the nature of their relationship with the companies they represent.

Most companies in Canada and the United States market their product under a set of contractual provisions known as the American Agency System (AAS) under which agents represent several companies and the customer is the customer of the agent, not the company, so that renewal business may be placed with the present insurer or another chosen by the agent who is said to 'own' the renewals.⁹ A small number of companies, several of them very large (e.g., Allstate, State Farm, GEIC) do not adhere to the AAS but use exclusive agents and deal directly with insureds on a renewal business. These are known as 'direct writers.'

All agents must, in most jurisdictions, be licensed. Licensing usually involves a credit check and related measures to exclude the obviously criminal and the clearly insolvent. This precaution is necessary because customers, at least under the AAS, pay the agent and not the company. The simpler forms of insurance fraud, in which the agent simply decamps after collecting the premium, are presumably discouraged in this manner.

Most jurisdictions further require the would-be agent to pass an examination of a technical nature which ensures that the agent will have the knowledge to advise the insured in respect of the coverages he/she should purchase.

An equivalent requirement to ensure that he/she uses it has yet to be found.

Once licensed, an agent may have his/her licence revoked for a number of offenses including the failure to remit clients' premiums and the violation of the rules on surplus-line insurance.

(h) Licensing and Regulation of Adjusters

Most claims are settled without recourse to lawyers and on a basis mutually satisfactory to claimant, company and insured, through the efforts of claims adjusters who may work for a given party (i.e., the company) or may be independents retained by either party to negotiate a settlement. Most jurisdictions license adjusters and regulate their activities in a manner analogous to the regulation of agents.

(i) Regulating Access

North American insurers do not follow the British practice of providing coverage to all comers, perhaps at a variable price. Instead, individual companies retain the right to accept or reject a given risk. In order that no individual will be rendered unable to obtain auto insurance, which is in certain circumstances compulsory in most U.S. and all Canadian jurisdictions, a variety of expedients have been adopted, ranging from Assigned Risk Plans, in which individual risks rejected by one company are assigned to a company chosen at random under the supervision of the local regulator, to all-industry pools such as the Ontario 'Facility' which will accept rejected risks and share them on a basis agreeable to all participants. Operation of these plans has generated a significant volume of criticism, since the rates charged to the substandard risks which regulate such plans are higher than the usual rates charged 'clean' risks. It must be noted, however, that nearly all such plans are operated at a loss despite the higher premiums.

(j) Ombudsman Roles

Most insurance commissions or superintendents of insurance play an important 'good offices' role which is not, strictly speaking, regulatory nor is it provided for by statute. This role is one of handling complaints by insureds, by third party claimants, and by individuals having difficulty in achieving either status, and of applying moral suasion (backed by the undoubted ability of the superintendent (commissioner) to make easy things difficult) to ensure that legitimate complaints are taken care of without needless resort to litigation. At the same time, the superintendent (commissioner) may be able to explain insurance practices and the limits to the responsibility of insurers, and the reasons therefor, to those whose complaints seem frivolous, vexatious or otherwise groundless.

Not all of these functions are performed by regulators in all jurisdictions. In particular, not all regulate rates, nor do those who do so regulate them in the same way with the same results.

We should also note a major difference between Canadian and United States regulation. United States regulation was, prior to 1944, predicated on the belief that insurance was not commerce, or if commerce, not interstate. While that belief was dashed in 1944 in the Southeastern Underwriters Association case, subsequent federal legislation has left the field to the state regulators. In Canada, a basic federal presence was established almost immediately; provincial regulation has been accepted to the extent that it does not conflict with federal initiatives (Citizens Insurance Co. v. Parsons (1881), 7 App. Cas. 96). A basic division of labour has resulted in which provincial agencies regulate policy terms, collect loss experience, license and examine provincial companies, agents and adjusters, operate assigned risk plans or supervise substitutes, act as ombudsmen and apply such rate regulation as exists. The federal superintendent admits and examines companies licensed to do business Canada-wide and concerns himself largely with solvency issues.

THE FUNCTIONS OF RATING BUREAUS

Rating bureaus, as a form of institution, antedate the introduction of effective rate regulation in most jurisdictions. Indeed, rating bureaus, in their heyday, provided rate regulation under private auspices using a variety of devices familiar to students of cartels. They gathered loss experience, processed it to yield premium rates, and in some cases enforced the application of the proposed rates by auditing all policies issued by member companies. A variety of sanctions were used to punish violators.

With the advent of regulation, much of the enforcement role of the rating bureaus was passed to official regulatory agencies. Bureaus continued to function as statistical agents, as standardizers of policy terms, and as setters of rates, though the latter had to be officially accepted by the regulators. Punishment of violators was turned over to the state regulators. During most of the period prior to about 1965-70, and in most jurisdictions, performance of state regulators is well described by the Stigler 'regulatory capture' model.¹⁰

Under state regulation, most rating bureaus have continued to function, performing the statistical agency function. The activities of most, particularly in the United States, go beyond the collection and analysis of loss data and extend to the development of proposed premium rates for their membership to apply. It is this price-fixing activity of bureaus that led to the South-eastern Underwriters prosecution under the Sherman Act and which has provided a safe harbour if done under state regulatory control by the McCarran-Ferguson Act.

It should be noted that there are technical reasons why the premium fixing process and the actuarial analysis of loss experience are difficult to separate. The loss-ratio method of analysis, which is widely used, requires existing premium rates as an input and produces proposed premiums incorporating the desired loss ratio. It does not produce pure premiums (i.e., loss costs stripped of any allowance for expenses and underwriting profit) though the resulting proposed premiums can be adjusted with relative ease to yield pure premiums. In addition, rating bureaus/statistical agents control the definitions of categories for which loss experience is collected and

reported. This is important because it makes it difficult for insurers to collect enough data to set credible premiums for classes which are not recognized by the agency. This has been an important factor limiting the extent of rate deviations and the evolution of rate structures in all jurisdictions. In Canada, merit rating schemes under which rates are tied to loss experience have been widely used for decades; the introduction of such schemes in U.S. jurisdictions has been a slow and not always successful process. Bureaus may not only recommend rates to their members, they have also frequently appeared before insurance commissioners to oppose the approval of deviated rates. This was a much more frequent practice in the 1950s and 1960s than it is today.

TYPES OF RATE REGULATION

Most students of rate regulation categorize individual jurisdictions into one of the following broad categories insofar as their basic regulatory methodologies are concerned:

- (1) File and use jurisdictions
- (2) Prior approval jurisdictions
- (3) Market competitions

'FILE-AND-USE' REGULATION

As the name implies, this system of regulation permits companies to put proposed rate changes into effect, either immediately upon filing with the regulatory agency or after a short waiting period. The former is more usual. Rate filings are substantially the same in content to filings made under prior approval systems and include actuarial analyses of past losses, projections of future losses and evidence to support the loading for expenses and underwriting profit. Companies seeking to deviate from the rates filed by their rating bureaus may file and use deviated rates, but must be prepared to produce actuarial evidence (or cost accounting evidence related to expenses) to support them.

While in certain respects more informal, the 'file-and-use' procedure permits the regulatory body to review the evidence before it in a more leisurely fashion than is usually the case in a 'prior approval' jurisdiction because there is no pressure to approve rates in a hurry in order to meet an implementation deadline. While there is nothing to prevent some prior approval regulators from taking as much time as they need, doing so may cut into underwriting profits and may shrink capacity as insurers move into more favourable jurisdictions. Others must approve or reject within a specified number of days after filing. If this is not done, the proposed rates go into effect automatically.

Of course it is possible that subsequent investigation of a filed and implemented rate may result in a finding that the rate is excessive. If so, it may be reduced and/or rebates of the excessive amount ordered. This rarely happens because the basic yardsticks used by most of the regulatory agencies, here and in prior approved jurisdictions, accept formulas which are indistinguishable from those used by the rating bureaus, i.e., the sum of actuarially-expected loss costs, adjusted for trend and inflation, plus operating expenses and an allowance for underwriting profit. There should be little room for argument about the magnitude of these items, except perhaps the trend-inflation adjustment.

In practice, adjustments to filed and implemented rates are unusual. The spread of file and use systems has been, in our judgment, as in that of others,¹¹ an important factor in the enhancement of competitive forces in the industry. While this is partly due to the system itself, it is also due to the relatively greater freedom to offer deviated or competitive rates that it makes possible. Other things being equal, it is much easier for other members of a rating bureau to oppose one member's deviations from yet unapproved rates with any degree of success. By the time the rate can be attacked in a file-and-use regulatory venue, it will probably have been copied by so many competitors that even victory becomes irrelevant in a competitive context.

'PRIOR APPROVAL' REGULATION

'Prior approval' regulation conforms to the classical model in which the companies propose rates to the regulatory body which examines their appropriateness and determines whether or not they may be used. Companies, or more usually rating bureaus on behalf of their member companies, file proposed rates together with actual and projected exposures and loss experience, operating expense experience and projected expense ratios. In most jurisdictions proposed rates flow directly from the projected losses plus expenses and incorporate a standard allowance for underwriting profits. Hearings are held to consider this evidence and any evidence filed by intervenors who object to the proposed rates. With appropriate modifications, the rates are then approved and allowed to go into effect.

Similar procedures are used for deviated rates, i.e., rates which differ from those proposed by the rating bureaus. Usually, such rates must be based on expense rate difference between the applicant and other rating bureau members. Deviated rates based on claims experience, often for a single class of insured, must perforce be based on the statistical experience of that company alone, since no data for the subdivided class are obtainable from the rating bureau. Such rates, based on a single company's experience, are often objected to on credibility grounds, i.e., arguments that one's company's experience does not provide an adequate sample size on which to base rates. Most statutes require that rates not be "unfairly discriminatory." As usually interpreted, this means that premium differences based on proven (i.e., statistically supported) loss cost differences are acceptable, but those for which such proof is lacking are not.

Deviated rates have become significantly more common in both prior approval and file-and-use jurisdictions than they were in the 1940s or 1950s; this is probably in response to market forces that are not officially recognized in the regulatory process.

'MARKET COMPETITION' REGULATION

This brand of regulation may be distinguished from 'file-and-use' by virtue of the fact that there is no for-

mal approval of the rates. Participants in the market may or may not file rates and loss experience, but file financial reports. The regulatory agency does not approve rates but may monitor rates in the several markets under its control closely seeking to identify those markets, if any, in which market competition is not producing rates approximating marginal costs. Where it is, markets are left alone as the best protection of the customer. Where it is not, the regulator may intervene. The regulator may have residual rate setting powers which may be brought into play, or it may increase competition by permitting brokers to place insurance in non-admitted markets.

The basic premise of this regulatory model is that competition is the best regulator of prices where it is permitted to operate, and that intervention in the process is justified only in those cases where for one reason or another there is no competition. California is the best-known state using a market competition regulatory model; others are Missouri and Idaho. Illinois has deregulated completely and does not intervene at all in the auto insurance market. One aspect of the open competition model is that insurers are able to set compensatory rates for all classes of insured, and that companies have less need to 'dump' individuals into assigned market plans. Only 1.9% of Californians insured were in an assigned risk plan in 1974 as compared with 3.7% nationally, and 10% in New Jersey.¹² The latter operates a stringent prior approval model. California does, however, have a serious uninsured motorist problem, with 15% - 20% of vehicles uninsured.¹³ New York adopted 'open competition' in 1970, but has moved back to a prior approval model.

CONTROL OF PROFITS

Most rating bureaus use, and most regulatory agencies accept, provisions for underwriting profit which are customary in origin and bear no observable relation to the rates of return required to attract investment into the industry. This rather cursory treatment of allowable profits is the most outstanding difference between price regulation in the insurance market and that found in traditionally-regulated public utilities.

These allowed mark-up rates ignore investment income, and, to the extent that the latter is significant, generate total profitability significantly in excess of the target rates, providing of course that the allowed mark-up is earned. Concern over the handling of investment income in the regulatory process has been a matter of continuing debate for 30 years or more. Adherence to the customary formulae reflects the complexity of the issues involved, the concern of regulators with the need to provide a continually expanding market for coverage and their concern lest a tougher policy on investment income generate a capacity crisis in their jurisdiction. Some efforts have been made to capture some of the excess profits generated by the conventional mark-ups, as in New York's recently introduced 'flexirate'.

Conventional mark-ups in Canada have been 2.5% of premium while in most U.S. jurisdictions a 5% allowance has been customary (others use 3.5% or 2.5%). These are applied to projected loss costs plus expenses. Loss experience suggests that the full mark-ups are seldom earned. Thus would appear that companies or rating bureaus adjust trend projections in the actuarial process to recognize 'market factors' or competition. The result is to establish rates which generate mark-ups more in line with market earnings requirements. Studies of insurance profits suggest that overall profits are related to the riskiness of the insurance portfolio¹⁴ and that they are related to the level of availability of investment earnings.¹⁵ Theoretical considerations suggest that if prospective earnings on prepaid premiums are high enough, insurers do not need any underwriting profits and can in fact absorb continuous underwriting losses (of predictable magnitude).¹⁶

CANADIAN REGULATORY EXPERIENCE

Generally speaking, the insurance regulation process in Canada stops short of regulating premium rates. In effect, and for most categories of insurance, the result is indistinguishable from the 'open competition' regulatory model existing in California. Companies do file rates with provincial insurance departments to keep the latter informed even where there is no formal obligation to file, and actuarial data developed by industry organizations, which act as statistical agents on behalf of

the superintendents, are also filed on a regular basis.

This pattern of laissez faire control does not extend to automobile insurance. In four provinces, private insurers have been displaced, at least from the market for basic coverages, by provincially-owned monopoly carriers. In four others, more formal rate regulation, confined to auto insurance rates, has been established by statute.

In Nova Scotia, a 'file-and-use' system was established by an amendment to the Provincial Insurance Act in 1960 [7 Eliz. II, c. 21, s. 32] and 1964 [11 Eliz., II c. 9, s. 108(2)]. These provide for approval or rejection of filed rates by the Provincial Utilities Commission. The Acts provide that if filed rates are not rejected within a short period, they go into effect automatically.

The corresponding Alberta statute, passed in the 1970s [R.S.A. 1980, c. I-5, s. 337f] sets up a prior approval regulatory scheme administered by a separate agency, the Automobile Insurance Board.

It is virtually impossible to describe the regulatory processes applied by these agencies, which are largely intuitive in character. Both agencies receive a great deal of statistical input from the statistical agent (The Insurance Bureau of Canada), the major rating bureau (The Insurance Advisory Organization) and other sources, together with proposed schedules of rates. From time to time, consultants have been engaged to assist the agencies in their interpretation of the data. In Nova Scotia, the body charged with applying regulation is the Board of Public Utilities Commissioners, a body which is well-experienced in applying conventional types of regulation to investor-owned public utilities in the province. It has had jurisdiction over insurance since 1960.

The PUC, early on, developed an understanding of the loss cost statistics which underlie the rate-making process. It did not have, and does not have, comparable data on operating expenses nor on underwriting profits. We note that while expense data on a national basis are scarce in Canada, such data on a provincial basis are either non-existent, or are the result of so many essentially arbitrary allocations of expenses incurred elsewhere that it may be pointless to seek them.

Parenthetically it should be noted that there is an even worse overhead allocation problem involved in estimating expenses by state in the U.S., and that the allocation process is one which tends to produce relatively uniform expense loadings across the country.

What the Nova Scotia Board has done is see to it that rates proposed for Nova Scotia do not discriminate on a provincial basis but reflect loss experience in that province. This represents, perhaps as realistic an approach as is possible.

While Alberta has set up a separate regulatory agency and imposed a prior approval format on its deliberations, the process has been, if anything, less formal than in the case in Nova Scotia. The criteria applied and the results obtained have been approximately the same.

Basic concerns of the regulators in both jurisdictions have been twofold: to ensure that average rate levels are 'appropriate' and to ensure that rate differentials are cost-justified. Even so, there have been claims that the rates for under-25 males are 'discriminatory' by Charter of Rights standards, if not in terms of the relevant Insurance Acts, and the Alberta Board has permitted the use of age/sex-based differentials on a year-by-year basis until a more appropriate basis can be found. Somewhat similar systems exist in New Brunswick and Prince Edward Island. Both operate within the same data base limitations as have already been noted in Alberta and Nova Scotia.

Viewed from nearby, auto rate regulation as practised in the Canadian regulatory process seems sloppy and inefficient in comparison with, for example, the regulation applied to utilities and pipelines. A similar observation could probably be made about actual regulatory practice in all but a few U.S. jurisdictions. Such a comparison is ill-founded, for competition in the marketplace for insurance provides an independent regulator of rates which is totally absent in the utility/pipeline case but which has operated quite effectively in the market for auto insurance and which has forced companies to lower expense rates and to pass on the savings in spite of regulation pressures which have often been exercised in the opposite direction. While data problems may preclude a more sophisticated approach to regulation, even the now

thoroughgoing regulation appears to be a poor substitution for competition.

PERSPECTIVE

While the California open competition regulatory model has been in effect since 1947, the predominant pattern of regulation adopted in the United States in the wake of the passage of the McCarran-Ferguson Act conformed fairly closely to the prior approval model. Statutes of this type, conforming to a model bill drafted by the National Association of Insurance Commissioners, were passed by 44 states.¹⁷ At least initially, any deviation from the rates promulgated by rating bureaus also required prior approval and had in some cases to be renewed annually. As an example of the extent to which prior approval regulation strengthened the control of rating bureaus over price, we note that in New York, in 1967, some 22.6% of automobile liability insurance was written at deviated rates, the rest at rates set by the bureaus. In contrast, in California, in 1966, 49.9% of automobile liability premiums were written at off-bureau rates.¹⁸

During the 1960s and 1970s, a number of states moved from prior approval to file and use or to the open competition model. New York adopted the latter in 1970; Illinois the year before.¹⁹ A file-and-use model was recommended by the Senate Subcommittee on Antitrust and Monopoly in 1961 and adopted for the District of Columbia in 1962. While some 2/3 of the states retained prior approval status as of the mid-1970s, many had effectively emasculated them by the adoption of procedures allowing deviated rates to go into effect without prior approval, reserving the latter requirement for basic bureau rates.²⁰

Much of this activity appears to have anticipated the trend toward deregulation in the United States; since the later 1970s there has been pressure for more regulation in a number of jurisdictions. It arose largely out of the problems experienced with product liability, medical malpractice and other general liability lines, in which sharp escalation in rates and attempts by insurers to reduce exposure created a major affordability and availability problem in a number of jurisdictions.

The most important jurisdiction moving to re-regulate insurance is New York, which introduced an excess profits plan for automobile lines in 1982, requiring the refund to insureds of earnings in excess of a permitted book rate of return on net worth which is 3% in excess of an indicated rate of return found by regressing book rates of return on risk and growth variables. Subject to this provision, insurers are free to set their rates alone or through a rating bureau.

A new elaborate form of regulation was adopted in 1986 for commercial lines. Labelled 'flex-rating', the system permits changes within a fairly narrow band (10% to 30%) on a file and use basis; changes beyond these limits are available only on a prior approval basis. The apparent objective of this system is not to impose any limit on rates but to discourage sudden large premium increases and to force more attention to long-term trends.

These systems are so new that there is not much experience with them; a further complication in attempting to evaluate their impact is the impact of New York's tort law reforms in 1972 and 1978 which have severely restricted access to damages for non-economic loss (usually pain and suffering).

Much of the pressure for renewed regulation on auto insurance in the United States comes, as it does in Canada, as the result of a series of sharp increases in premium rates. These have come about because insurers have misestimated the trend in loss costs during periods of accelerating inflation and have been forced, in order to preserve solvency, to raise rates at a rate in excess of the rate of inflation, just as a rider who has missed a bus must run faster than the bus if he/she is to catch it in the next block. The problem has been exacerbated in most North American jurisdictions by the fact that court judgments which influence claim costs have risen faster than inflation. This is a problem which regulation cannot solve.

There were two major studies of insurance regulation published in the 1970s, Paul Joskow of M.I.T., writing in 1973, concluded:

- (1) Prior approval rate regulation should be eliminated and replaced with a no-filing

system allowing insurance prices to be determined competitively...

- (8) Attempts by some states to go toward more price regulation rather than less should* be vigorously discouraged...

There are very few examples of deregulation in the history of regulation in the United States. Here is an example, however, of a situation in which regulation has worked to the benefit of almost no one (except perhaps the direct writers) in the last fifteen years...

...Those states which have eliminated formal rate regulation should be congratulated and other states encouraged to follow their examples.²¹

The second study, by Paul MacAvoy, on loan from Yale to the Council of Economic Advisors, concluded:

The evidence strongly suggests that unrestricted price competition is superior to rigid rate regulation as a way of achieving reasonable prices, a reliable insurance mechanism and economically fair prices which are based on an accurate assessment of the risk presented.²²

Several additional studies by Hill²³ and by Frech and Samprone²⁴ found, as did Joskow and MacAvoy, that premium rates and/or profits were higher in states with regulation. Another study by Ippolito²⁵ claims that the hypothesis of higher rates in regulated states is not borne out by the facts he examines. His analysis is limited to 10 states, to some 30 companies and to quoted rates for a sample of hypothetical drivers. His regression analysis does find that rate levels are strongly positively related to the proportion of the population covered by assigned risk plans. This proportion is known to be higher in states with prior approval regulation. This variable is therefore collinear with the variable whose influence is being tested and appears to have accounted

for much of the effect that would otherwise be attributed to regulation.

A more recent study, dealing with experience from 1973-85, is that completed by the U.S. General Accounting Office.²⁶ This study purports to show that insurance is less costly in regulated states than in more competitive jurisdictions. The latter category, as defined for the study, includes all firms of file-and-use jurisdictions so that the 'regulated' category includes prior approval jurisdictions only.

Two measures of cost are used - an average premium per vehicle calculation and the inverse loss ratio, i.e., the amount of premium collected per dollar of claims paid. Average premiums may differ from one locality to another for a variety of reasons, most important of which are differences in the risk composition of the local insured population. There are significant differences between states in the proportion of under-25 drivers, in that of drivers over 70, and these are not corrected for the study.²⁷ Further differences are due to differences in coverages purchased and in the extent to which the automobile claims system is of a no-fault character. The latter is considered in the analysis, but the failure to consider the other factors render the comparisons on an average premium basis essentially worthless.

The other comparison, based on inverse loss ratios, is less obviously error-ridden than the average premium comparison. However, unless all risk classes have the same loss ratios in all jurisdictions, changes in the risk mix will also affect the reported loss ratio and its inverse. Most actuarial schemes set rates which are intended a priori to produce equal loss ratios for all the classes they cover; in fact such equality is rarely attained.

The average data show an inverse loss rate of 1.49 for so-called competitive rating states; 1.47 for those regulated on a prior approval basis.²⁸ However, this difference is more than explained by the differences in the percentage of motorists covered on a voluntary basis and those covered under assigned risk and similar plans - 6.7% in regulated jurisdictions, nearer 1.1% in competitive ones.²⁹ In competitive rating states the inverse loss ratio is 1.393, in prior approval states it is lower at 1.256.³⁰ Table 1 shows a computation of the inverse

loss ratio for the two groups, assuming an inverse loss ratio of 1.5 for voluntary risks in both types of jurisdiction, and using reported loss ratios for assigned risks.

TABLE 1

Computation of Estimated Average Inverse
Loss Ratios, as Affected by Voluntary Risk Coverage
and Loss Experience of Assigned Risk Plans, U.S. 1973-85

Competitive Jurisdiction	Share of Market	Inverse Loss Ratio	Weighted ILR	
Voluntary Risks	.989 x	1.50*	=	1.484
Assigned Risks	.011 x	1.393	=	<u>.015</u>
Average				1.499 1.50
<u>Regulated Jurisdiction</u>				
Voluntary Risks	.9233 x	1.509	=	1.385
Assigned Risks	.0767	1.256	=	<u>.096</u>
Average				1.481 1.48

*assumed

Table 1 indicates that a difference in the computed loss ratio in favour of the regulated jurisdictions in an amount equal to that reported in the study could be explained by these factors alone. The system as a whole loses money on assigned risk insureds; consequently, the evidence that insurance is cheaper in regulated jurisdictions proves nothing beyond the obvious fact that larger subsidies can produce lower prices.

Nor is the assigned risk plan evidence the only factor explaining the differences. Loss ratios can be higher, and inverse loss ratios lower, in no-fault jurisdictions where claim adjustment expenses can be reduced to trivial levels, than it is in the jurisdictions where liability is based on negligence. There are more no-fault states in the regulated group.

A number of other comparisons are made in the study; its piece de résistance is a statistical regression analy-

sis which we regard as defective because it is linear and treats a number of risk-modifying variables as if these were additive, whereas the differential complexes used in most actuarial studies treat them, correctly in our view, as multiplicative. The average premium regressions are suspect for the reasons given. The regression on inverse loss ratios explains 17% of observed differences for liability insurances, 2% of that for liability. The only variables to have statistically significant variables were the existence of no-fault liability, a compulsory liability coverage variable and a term representing the interaction of prior approval regulation with the degree of urbanization. None is more significant in the physical damage case.

In short, the study's evidence does not support the conclusion it has drawn from the regressions.

The preponderance of the empirical evidence from the United States supports the view that regulation increases costs to consumers; the results of those few studies with contrary findings are easily explicable in terms of defects in statistical methodology.

Our review suggests that there is no reason to believe that experience with regulation in Canada would be more favourable. Existing regulation in two provinces is of a passive-submissive variety which tells little or nothing about the likely outcome of regulation which imposed a constraint on underwriting profits, more severe than that imposed by market competition.

Ontario's experience with rent control is of some relevance here; its major impact has been to reduce the supply of new rental housing to the vanishing point. There has been no immediate deterioration in the apparent quantity because the assets regulated are immobile. Insurance companies' assets are not immobile and a system of price controls which reduced returns as severely as rent review would not only inhibit additions to supply, but could encourage a withdrawal of existing capacity. Regulation on the existing U.S. pattern does not adversely affect supply; the evidence is that it guarantees profit margins at the expense of the consumers.

It is concluded that if regulation is to be imposed in Ontario it should be of the open competition variety in

effect in California. As a next best, a file-and-use model could be imposed. No economic case can be made for more stringent regulation. Indeed, there is a strong case against it based on the likelihood of increased rates or an adverse supply response.

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CONSTITUTIONAL AUTHORITY TO
ENACT NO-FAULT AUTOMOBILE
ACCIDENT INSURANCE SCHEME

An opinion prepared for the Inquiry Into Motor
Vehicle Accident Compensation in Ontario

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CONSTITUTIONAL AUTHORITY TO ENACT NO-FAULT
AUTOMOBILE ACCIDENT INSURANCE SCHEME

THE OPINION REQUESTED

I have been requested by the Commission of Inquiry into Motor Vehicle Accident Compensation in Ontario to provide an opinion on the question whether the Charter of Rights imposes constitutional restrictions on the power of a provincial Legislature to enact a 'no-fault' system of compensation for injuries arising out of automobile accidents.

The Inquiry was established by the Government of Ontario, by Order in Council (O.C. 2962/86), on November 6, 1986. The sole Commissioner is the Honourable Mr. Justice Coulter A. Osborne, a Judge of the Supreme Court of Ontario. The terms of reference, as stipulated by the Order in Council, are "to inquire into and report ... on the tort system of compensation for injury by automobile accident and the consequences of the implementation of a no-fault automobile accident insurance scheme".

A precursor of the Inquiry was the Ontario Task Force on Insurance, chaired by Dr. David Slater, which was critical of the tort system as a means of providing compensation for accidents, and which recommended a further inquiry into automobile accidents in particular. The Final Report of the Ontario Task Force on Insurance (Ministry of Financial Institutions, Ontario, May 1986) is referred to in several places in this opinion as the "Slater Report".

The Inquiry has received a Submission, dated March 10, 1987, from a Committee of the Canadian Bar Association - Ontario (hereafter "the C.B.A.-O. opinion"), that the introduction of a no-fault system would violate ss. 7 and 15 of the Charter of Rights and could not be justified under s. 1. The Inquiry has also received a Submission, dated April 23, 1987, from the Insurance Bureau of Canada, which includes as Appendix 4 an opinion, dated April 21, 1987, by Neil Finkelstein, entitled "The Constitutionality of Provincial Legislation Promulgating the Insurance Bureau of Canada's Proposed Modified No-Fault Automobile Insurance Plan" (hereafter, "the Finkelstein opinion"), which argues that there is no constitutional impediment to the introduction of a no-fault scheme along the lines proposed

by the Insurance Bureau in its Submission. In the opinion that follows, I will make reference to both the C.B.A.-O. opinion and the Finkelstein opinion. In general, I do not find the arguments presented in the C.B.A.-O. opinion to be persuasive, and I prefer the arguments presented in the Finkelstein opinion.

My conclusions are set out in detail at the end of this opinion, but my general conclusion is that there are no constitutional restrictions on the power of a provincial Legislature to enact a no-fault system of compensation for injuries arising out of automobile accidents.

NO-FAULT AUTOMOBILE ACCIDENT INSURANCE

At the time of writing, the Inquiry is still in its early stages, and no decisions have been taken, even tentatively, as to the Inquiry's recommendations. I have no idea whether the Inquiry will recommend a no-fault system of compensation for automobile accidents, and, if it does so recommend, what form the recommended system would take. Accordingly, in this part of the opinion, I shall simply sketch out briefly what I assume to be the rationale and general characteristics of a no-fault system, identifying those elements that could be subjected to constitutional attack. Needless to say, if the ultimate recommendations depart radically from my assumptions, this opinion would need to be reviewed.

The rationale for a no-fault system of automobile insurance is to correct deficiencies in the tort (negligence) system. Under the tort system, the victim of an automobile accident is compensated only if the accident was caused by someone else's negligence. A victim of an automobile accident who cannot establish negligence is uncompensated. The Slater Report concluded that more than 50% of automobile accident victims receive no compensation through the tort system: Slater Report, 55.

Negligence must be proved, and proof is expensive, involving as it does the use of lawyers, insurance adjusters and other experts, all of whom are entitled to be paid. The Slater Report concluded that more than 50 cents of each premium dollar is absorbed by the administrative and legal costs (transaction costs) of the tort-insurance

system; the transaction costs of no-fault systems were only 10 to 20 cents of each dollar: Slater Report, 66.

Proof of negligence in a congested court system often involves serious delays. Thus, even the winners in the tort system - those who succeed in recovering full damages - may have to endure several years of uncompensated uncertainty. If a no-fault system worked properly, there would be no reason for delay in the award of compensation, and benefits could be paid promptly: Slater Report, 65-66.

The advantages of a no-fault system are that:

- (a) all automobile accident victims would be compensated, regardless of whose fault caused the accident;
- (b) the transaction costs would be much reduced, thereby freeing resources for the extended coverage; and
- (c) compensation would be certain, speedy and predictable in amount.

The disadvantages of a no-fault system are that:

- (a) the system may be less effective in deterring bad driving; and
- (b) the level of compensation may be set at a level below common-law damages.

Ontario has already taken several steps in the direction of a no-fault system. Since 1980, all owners of automobiles have been required by statute to take out a standard insurance policy, which includes a minimum of \$200,000 of third party insurance. This standard insurance policy indemnifies whomever is driving the insured automobile against tort liability to third parties. The policy thus relieves the driver of financial responsibility for his/her negligence, except in the case where damages exceed the amount of the insurance.

The mandatory standard insurance policy also contains, in Section B, provision for modest no-fault benefits for personal injury arising out of the use of the insured automobile. These benefits are payable to the driver of

the insured vehicle, passengers in the insured vehicle and pedestrians injured by the insured vehicle. Thus, Ontario has a no-fault system now. However, the level of benefits is so low that it does not discourage resort to the tort system by those victims who believe that they can prove negligence: Slater Report, 76-77. If the Section B benefits were improved, there would be less resort to the tort system.

A no-fault system could provide benefits equal to common-law damages in tort. However, this opinion will assume that a no-fault system would provide a level of benefits below common-law damages.

A no-fault system could exist side-by-side with the tort system, as is now the case with the Section B benefits. Under such an add-on system, a victim would not be deprived of the right to sue in tort, and the victim would presumably exercise that right if he or she believed that more damages than the no-fault benefits could be recovered through the tort system.

A no-fault system could wholly replace the tort system. This has been the case in Ontario since 1914 with respect to industrial accidents. Workers' compensation provides no-fault benefits for employees injured at work. Their tort action has been taken away by statute so that the high transaction costs of the tort action are removed from the system. Quebec has followed this model for automobile accidents as well. Quebec has a no-fault system and no tort action.

A no-fault system could partially replace the tort system. Many American states have introduced 'threshold' no-fault systems for automobile accidents. In these systems, the tort action is abolished for cases that do not reach a statutory threshold, which in some states is defined by a monetary figure, and in others by a verbal formula. Under a threshold system, the common-law right of action is retained for the most serious injuries - those that exceed the threshold.

The constitutional attack by the C.B.A.-O. opinion assumes a system of no-fault automobile insurance that:

- (a) provides benefits less than common-law damages;
and
- (b) deprives some or all victims of the tort action.

In such a system, the victim of an automobile accident who can prove negligence is arguably worse off than he or she would have been in the tort system. I say "arguably" because the speed, certainty and predictability of no-fault benefits might make the no-fault alternative more attractive to some potential plaintiffs. My opinion will consider the constitutionality of a system with the aforementioned two characteristics, that is, the provision of benefits less than common-law damages and the complete or partial abrogation of the tort action.

DISTRIBUTION OF POWERS

The Constitution Act, 1867, by s. 92(13), confers on the provincial Legislatures the power to make laws in relation to "property and civil rights in the province". It is well settled that this head of power extends to the regulation of insurance, including automobile insurance: Canadian Indemnity Co. v. A.-G. B.C., [1977] 2 S.C.R. 504. It is also well settled that this head of power extends to the law of torts, including the creation, modification or abrogation of causes of action: MacDonald v. Vapor Canada, [1977] 2 S.C.R. 174. It is clear, therefore, that in the Canadian federal system it is the provincial Legislatures and not the federal Parliament that possess the power to enact a legal regime of no-fault automobile insurance and the power to restrict or abolish the action in tort for automobile-related losses.

SECTION 96 OF THE CONSTITUTION ACT, 1867

Quebec has a no-fault automobile insurance plan which denies the tort action to accident victims. In Tardif v. Berube (1986), 34 D.L.R. (4th) 24 (Que. S.C.), the Quebec plan was attacked on the basis that automobile accident victims were denied recourse to the courts, since claims under the plan were adjudicated by the board that administered the plan, the Régie de l'assurance automobile du Québec. The attack was based on s. 96 of the Constitution Act, 1867, which by implication stipulates that functions

traditionally exercised by superior courts may not be transferred to administrative tribunals.

Gervais, J. rejected the s. 96 argument, holding that the administration of a no-fault insurance plan was so different from the administration of a fault-based tort system that there was no analogy to the traditional functions of a superior court. He pointed out that non-curial systems for adjudication of workers' compensation claims existed in every province and had always survived s. 96 attack, the leading case being Farrell v. Workmen's Compensation Board, [1961] S.C.R. 48.

The decision in Tardif v. Berube, although only rendered at the trial level, is so plainly correct that I will say no more about this issue, except to note that the C.B.A.-O. opinion does not argue that s. 96 is a ground of invalidity of a no-fault plan.

My conclusion is that, if the province were to establish a no-fault insurance plan for automobile accidents, the adjudication of claims under the plan could be entrusted to an administrative tribunal outside the ordinary courts, as has been done in all provinces for workers' compensation.

SECTION 7 OF THE CHARTER

Text of s. 7

Section 7 of the Charter provides as follows:

Everyone has the right to life, liberty and security of the person and the right not to be deprived thereof except in accordance with the principles of fundamental justice.

'Liberty' and 'Security of the Person'

The first question to be considered under s. 7 is whether the right to sue in tort comes within the words 'liberty' or 'security of the person' in s. 7. If it does, and if the right is taken away in violation of the principles of fundamental justice, then a breach of s. 7 would occur.

At this stage in the evolution of the Charter, there is no settled definition of liberty or security of the person and many different definitions have been propounded. I have reviewed all the cases, but I see no point in describing them here. It seems to me to be unlikely that the Supreme Court of Canada would decide that a cause of action in tort which has not yet accrued is within the words liberty or security of the person. That amounts to saying that everyone has a legitimate and constitutionally-protected expectation that the common law will not be changed to his or her detriment in the future. That is a profoundly conservative reinforcement of the status quo which in my view would not be accepted by the Supreme Court of Canada.

My conclusion does not depend upon my view of the meaning of liberty and security of the person. As I shall explain in the next section of this opinion, in my view a no-fault insurance scheme could not violate s. 7, because it would not be a breach of the principles of fundamental justice.

Fundamental Justice

If I am wrong and liberty or security of the person does include the right to sue in tort, a breach of s. 7 will occur only if the right has been taken away in violation of "the principles of fundamental justice".

In Re s. 94(2) of the Motor Vehicle Act, [1985] 2 S.C.R. 486, the Supreme Court of Canada held that fundamental justice was not merely a procedural concept, and that it was violated by a criminal offence of absolute liability under which an innocent person could be convicted and imprisoned. Lamer, J. for the majority said (at p. 503) that the principles of fundamental justice "are to be found in the basic tenets of our legal system". The more specific rights in ss. 8 to 14 of the Charter provided "an invaluable key" to what those basic tenets were. The principle that an innocent person ought not to be liable to conviction and imprisonment was a principle of fundamental justice.

I do not think that it can plausibly be argued that the replacement of tort liability with a no-fault insurance scheme violates principles of fundamental justice. There is nothing in ss. 8 to 14 of the Charter that im-

plies that civil liability must always be premised on fault. The common law itself imposes civil liability on a no-fault basis in many situations (e.g., breach of contract, carrier, innkeeper, Rylands v. Fletcher), but most notably in the law of negligence itself, where the employer's vicarious liability for the torts of his employees is a no-fault liability. In the case of automobile accidents, compulsory third party insurance has severely weakened the idea of fault as a basis for tortious liability, since the effect of insurance is to relieve the at-fault driver from liability. I have no doubt, therefore, that the substitution of a no-fault insurance plan for the present tort system would not be held to be a breach of fundamental justice.

Policy

Since the denial of the tort action would not be a breach of s. 7 of the Charter, it is not necessary to ask whether a no-fault insurance scheme provides anything in return for the loss of the valuable right to sue in tort. But, if this question is asked, it must be remembered that a no-fault scheme would operate only prospectively. It would not take away causes of action that have already accrued. The no-fault scheme, on its introduction, would therefore apply to every individual who has not yet been involved in an accident and who is at risk of being (1) the victim of an accident in which fault can be established, (2) the victim of an accident in which fault cannot be established, and (3) the at-fault cause of an accident in which a victim is injured. The introduction of the no-fault scheme arguably diminishes each individual's rights under risk (1), above (although even this is unclear in view of the speedier, more certain benefits of a no-fault scheme), but the no-fault scheme enhances each individual's rights under risks (2) and (3), above. What a no-fault scheme would provide is comprehensive insurance coverage against all the risks associated with the use of automobiles. That is a benefit that is valuable to every individual. Whether it is preferable to the tort action as a response to automobile accidents is a matter of policy upon which people are bound to disagree. However, I am certain that the Supreme Court of Canada would decide that the Legislature is entitled to choose the no-fault alternative, just as I believe the Court would uphold workers' compensation. These are policy choices that do not implicate fundamental civil libertarian values, and cer-

tainly not values protected by the Charter of Rights.

American Case-Law

In the United States, the fourteenth amendment provides that "nor shall any State deprive any person of life, liberty or property, without due process of law". (The fifth amendment includes a similar clause binding on the federal government.) The due process clause, which is the analogue of s. 7 of the Charter, has been interpreted by the Supreme Court of the United States as not protecting the continuance of common-law causes of action.

In New York Central Railroad Co. v. White (1917), 243 U.S. 188, the Court upheld New York's workers' compensation law, which imposed no-fault liability on employers to compensate injured employees at a rate lower than common-law damages; the tort action for negligence was abolished. The Court pointed out that no-fault liability was not unusual, both under statute and at common law. It was not a denial of the due process clause to replace fault liability with no-fault liability. "No person", the Court said (at p. 198), "has a vested interest in any rule of law entitling him to insist that it shall remain unchanged for his benefit". This sweeping affirmation of legislative power to alter common-law negligence principles was repeated two years later in the Arizona Employers' Liability Cases (1918), 250 U.S. 400, where other workers' compensation laws were upheld.

In Duke Power Co. v. Carolina Environmental Study Group (1978), 438 U.S. 59, the Court upheld a federal statute that abolished tort liability and substituted no-fault liability with limited benefits for nuclear accidents. Burger, C.J. for the Court referred to the workers' compensation cases and said (at p. 88) that "it is not clear at all that the Due Process clause in fact requires that a legislatively enacted compensation scheme either duplicate the recovery at common law or provide a reasonable substitute remedy". However, in any event, he held that despite the limited benefits, the no-fault plan did "provide a reasonably just substitute for the common-law or state tort law remedies it replaces".

Many American states have enacted no-fault automobile insurance schemes coupled with restrictions on tort actions. None of these schemes has yet been considered by

the Supreme Court of the United States, but there has been extensive litigation in the state courts and constitutional challenges have generally been unsuccessful. The cases are comprehensively reviewed in Josephine Y. King, "Constitutionality of No Fault Jurisprudence", [1983] Utah L. Rev. 797. An earlier article is George J. Siedel, "The Constitutionality of No-Fault Insurance: The Courts Speak" (1976-77), 26 Drake L. Rev. 794. The U.S. cases are also reviewed in Appendix D of the Finkelstein opinion. They are not referred to in the C.B.A.-O. opinion.

Conclusion on s. 7

The American case-law under the due process clause powerfully reinforces my opinion that the replacement of the tort remedy by a no-fault insurance plan for automobile accidents would not be a breach of s. 7 of the Charter. The constitutional position would be exactly the same as that of workers' compensation, which in my opinion is also not a breach of s. 7.

SECTION 15 OF THE CHARTER

Text of s. 15

Section 15(1) of the Charter provides as follows:

Every individual is equal before and under the law and has the right to the equal protection and equal benefit of the law without discrimination and, in particular, without discrimination based on race, national or ethnic origin, colour, religion, sex, age or mental or physical disability.

Discrimination

The argument that s. 15 would be infringed by a no-fault insurance system for automobile accidents is that the victims of automobile accidents would be treated differently than the victims of other kinds of accidents. For those victims who are unable to prove fault, the treatment would clearly be superior, thus constituting discrimination against non-automobile accident victims. For those victims who are able to prove fault, the treat-

ment would arguably be inferior, thus constituting discrimination against automobile accident victims.

The grounds of discrimination enumerated in s. 15 do not include fortuitous matters such as the cause of an accident. However, it is plain from s. 15 that the enumerated grounds are not exhaustive, and that other distinctions could be offensive to s. 15. It is also plain that not every legislative distinction is a violation of the Charter of Rights, because nearly all statutes would fall on that basis. What has not yet been clarified by the Canadian courts is what kinds of non-enumerated distinctions are forbidden by s. 15. Also unclear is the extent to which an inquiry into the justification for a distinction takes place within s. 15 itself or under s. 1.

The controversies over the meaning of s. 15 are reported in my book Constitutional Law of Canada (2nd ed., 1985), 798-801, where I suggest that all legislative distinctions are violations of s. 15 and have to be justified under s. 1. This view is a minority one, the more general view being that some standard of reasonableness is implicit within s. 15 itself. All of the courts that have found it necessary to choose between these two approaches have chosen the latter approach. The leading case is Re Andrews and Law Society of B.C. (1986), 27 D.L.R. (4th) 600 (B.C.C.A.), where the British Columbia Court of Appeal held that the citizenship requirement for admission to the Bar of British Columbia was contrary to s. 15 of the Charter. McLachlin, J.A. for the Court held that s. 15 did not condemn all legislative distinctions, only those that were not "reasonable or fair". The test under s. 15, she held (at p. 609), was "whether the impugned distinction is reasonable or fair, having regard to the purposes and aims [of the legislation] and its effect on persons adversely affected". Only if legislation failed this test would s. 1 become relevant, and in exceptional circumstances discriminatory legislation might still be held to be justified under s. 1. In the Andrews case itself, she held that the citizenship requirement failed the "reasonable or fair" test under s. 15, as well as the tests for justification under s. 1.

The weight of authority is clearly in favour of an approach akin to that taken in the Andrews case, and I now think that this approach (or something like it) will be adopted by the Supreme Court of Canada. This opinion will

proceed on that assumption. However, my conclusion does not depend upon that assumption. As I shall explain in the next section of this opinion, in my view a no-fault insurance scheme could be justified under s. 1.

Application to Automobile Accidents

The test applied in the Andrews case was "whether the impugned distinction is reasonable or fair, having regard to the purposes and aims [of the legislation] and its effect on persons adversely affected". Would a no-fault insurance scheme, applicable only to automobile accidents, satisfy this test (or something like it)? In my opinion, the answer is clearly yes.

In considering whether there is a reasonable and fair justification for the distinctive treatment of automobile accident victims, it is relevant to notice that the law of Ontario and the other Canadian provinces already makes important distinctions between different classes of accident victims, all of whom are arguably equally in need of compensation. Even the common law itself denies (or used to deny) compensation to those who cannot prove fault, as well as to those who are caught by the volenti doctrine, the contributory negligence doctrine (before reform) or the fellow-servant doctrine (before repeal).

Dissatisfaction with the incomplete coverage of the common law has led in every Canadian province to the replacement of the common law tort system with no-fault liability for industrial accidents. These schemes of workers' compensation have introduced a further distinction into the law, namely, between those victims injured at work and those injured elsewhere. However, the justification was, and remains, that employers should pay for all of the injuries caused by their business activity, not just those in which negligence could be proved. The employer could and should treat the cost of providing no-fault benefits as a cost of doing business which would enter into the price of the product and thus be indirectly paid for by the consumers of the product. The removal of the tort action was necessary to remove the high transaction costs from the system so as to enable each dollar of the workers' compensation premium to purchase as much compensation as possible.

A very similar rationale can be applied to automobile accidents. Owners of vehicles in Ontario are already singled out for special treatment in that, as explained earlier, they are obliged to purchase a standard insurance policy which includes third party coverage and modest first party no-fault coverage. Victims of automobile accidents, unlike victims of other accidents, benefit from the existence of this compulsory insurance. It is only a short step to the proposition that car owners and others who benefit from the roads ought to compensate for all of the injuries that, statistics show, will inevitably be produced by this dangerous activity. A policy decision to enrich the compensation payable to all by denying the tort action to those who can prove fault could be justified on the same basis as it can be justified in the case of workers' compensation.

I conclude that the owners of automobiles form a class of people who benefit from a uniquely dangerous activity, and who may be required to buy no-fault insurance as a condition of vehicle registration. The nature of that insurance scheme is a matter of policy for the Legislature, but I have no doubt that it could include the abolition of the tort action.

It is possible to design an accident compensation system that treats all victims alike. No claim of discrimination could be made against a system like that of New Zealand which has universal application. But it is surely 'reasonable' and 'fair' for reform to proceed in stages. Employers create risks against which they can carry insurance: that fact justifies the distinctive treatment of industrial accidents. Car owners also create risks against which they can carry insurance: that fact justifies the distinctive treatment of automobile accidents. Outside these two classes (which include most of society's accidents) it is not easy to identify the persons who should buy the insurance, and so compensation for accidents in the home or during recreation require a more radical approach. I cannot imagine that the Supreme Court of Canada would insist that only a universal system of no-fault insurance could satisfy s. 15 of the Charter. In my view, the rationale for a system confined to automobile accidents is so plain that a court would hold that the special treatment of automobile accidents was 'reasonable and fair' having regard to the purposes and aims of the no-fault system, and accepting that some victims would

receive lower compensation under such a system.

I conclude that a system of no-fault insurance for automobile accidents would not infringe s. 15 of the Charter.

The Piercey, Streng and Kask Cases

The C.B.A.-O. opinion (at pp. 45-47) relied on three decisions of trial courts - Piercey, Streng and Kask - to support its argument that a scheme of no-fault automobile insurance would violate s. 15 of the Charter.

Only one of the three cases - Piercey - is at all close to the present issue. It does support the C.B.A.-O. position, and is inconsistent with my opinion. The case is Piercey v. General Bakeries (1986), 31 D.L.R. (4th) 373 (Nfld. T.D.). In that case, Hickman, C.J. of the Trial Division of the Supreme Court of Newfoundland held that the denial of the tort action in Newfoundland's workers' compensation statute was a violation of s. 15 of the Charter. Indeed, he went so far as to say (at p. 387) that the denial of the tort action was so unreasonable that it "stands out as an intolerable blot upon the legislative landscape of a free and democratic nation".

The Piercey case is only a decision at first instance, and the ruling on s. 15 was not strictly necessary for the decision, because the facts of the case arose before s. 15 came into force. The ruling on s. 15 is, in my opinion, wrong. The workers' compensation legislation in Newfoundland (and everywhere else in Canada) did not simply deny the action in tort to an arbitrarily selected group of accident victims. What it did was to substitute an entirely new system of no-fault employers' liability, which would provide compensation to injured workers on an insured, comprehensive, no-fault basis. This was done on the basis of a legislative judgment that workers would be better off, not worse off, under such a scheme. All workers benefit from the security of insurance against all risks of injury at work, and the assurance of speedy, predictable compensation. The legislative judgment to abolish the tort action reduced the compensation payable to the worker who could establish negligence, but it also meant that more of each premium dollar would go to workers rather than to the lawyers and other intermediaries who operate the tort system. One could reasonably disagree

with that legislative judgment, but it is no more than a judgment about the design of an insurance scheme for industrial accidents. In my view, there was no basis for Hickman, C.J.'s extravagant criticisms, and an insufficient basis for a finding of a breach of s. 15. Other courts faced with the same issue have all upheld the denial of the tort action in workers' compensation schemes: Re Terzian and Workmen's Compensation Board (1983), 148 D.L.R. (3d) 380 (Ont. Div. Ct.); Ryan v. Workmen's Compensation Board (1984), 6 O.A.C. 33 (Ont. Div. Ct.); Budge v. Workers' Compensation Board, [1985] 1 W.W.R. 437 (Alta. Q.B.).

For the reasons given above, in my opinion, industrial accident victims form a sufficiently discrete class to support a distinctive no-fault insurance scheme without violation of s. 15. The same is true of automobile accident victims. In Streng v. Township of Winchester (1986), 56 O.R. (2d) 649 (Ont. H.C.), Smith, J. of the Ontario High Court struck down a short limitation period that was applicable to actions against municipalities, but not other defendants. In his view, the nature of the defendant was an irrational basis upon which to distinguish between injured plaintiffs. This was a very active application of s. 15 which has not been followed in a later Ontario case (Mirhadizadeh v. The Queen (1986), 57 O.R. (2d) 441 (Ont. H.C.)). But it is interesting to note that Smith, J. (at p. 657) suggested that "those suffering injuries in car accidents" would constitute a class that could rationally be treated distinctively without violation of s. 15. The Streng case thus provides no support whatever for a constitutional attack on no-fault automobile insurance.

A similar comment may be made about Kask v. Shimizu (1986), 28 D.L.R. (4th) 64 (Alta. Q.B.), in which McDonald, J. of the Alberta Court of Queen's Bench struck down the Rule of Court requiring out-of-province plaintiffs to post security for costs. His reasoning was that the rule offended s. 15 by discriminating against the poor: the plaintiff in the case lacked the resources to post security. It seems obvious that poverty as a ground of discrimination is much harder to justify than the classification involved in no-fault automobile insurance. Another element in Kask was the discrimination on the basis of province of residence, which McDonald, J. thought was probably a breach of the mobility rights in s. 6 of the Charter, although he did not rely on that ground.

This case is so remote from our present concerns that it lends no support to a constitutional attack on no-fault automobile insurance.

These three first instance cases - Piercey, Streng and Kask - would not warrant extended discussion, if it were not for the fact that the C.B.A.-O. opinion relies on them. The Finkelstein opinion (at pp. 26-30) also discusses the cases, reaching conclusions identical to mine. The three cases are slender reeds indeed upon which to base a constitutional attack on no-fault automobile insurance.

American Case-Law

In the United States, the fourteenth amendment guarantees "the equal protection of the laws". This equal protection clause has been interpreted by the courts as requiring that there be a "rational basis" for a legislative distinction. In general terms, what the rational basis test requires is that the impugned distinction must be a reasonable means of achieving a legitimate public purpose. This test is very similar to that used in the Andrews case and in the other Canadian cases that have followed Andrews. (The American courts apply a stricter test to 'suspect' categories, such as race, and the abridgment of fundamental rights, such as the right to vote.)

In New York Central Railroad Co. v. White (1917), 243 U.S. 188 and the Arizona Employers' Liability Cases (1918), 250 U.S. 400, the two workers' compensation cases described above, and in Duke Power Co. v. Carolina Environmental Study Group (1978), 438 U.S. 59, the no-fault nuclear accident case described above, the constitutional challenges to the laws were made not only under the due process clause but also under the equal protection clause. The challenge under the equal protection clause, like the challenge under the due process clause, was unsuccessful. There was a sufficiently rational basis for the distinctive treatment of one class of accident victims.

As explained above, there are numerous American cases in which state no-fault automobile insurance schemes have been challenged. None of the cases has been decided by

the Supreme Court of the United States, but many of them have been decided by the highest state courts. Not a single case of which I am aware has held that the distinctive treatment of automobile accident victims violates the equal protection clause, although the equal protection clause has been invoked in virtually every case.

Many American states, as part of a no-fault automobile insurance scheme, deny the tort action in cases where the injuries are minor and permit the tort action in cases where the injuries are major. I have already explained that the American courts have generally held that the denial of the tort action is constitutional. But the statutory 'thresholds' which distinguish the cases in which the tort action is preserved from the cases in which the tort action is abolished, have been challenged on equal protection grounds. In some states, these thresholds are expressed in monetary terms, based on the amount of the medical expenses incurred by the victim. Thus, if the threshold is \$10,000, a victim whose injuries give rise to medical expenses of less than \$10,000 is confined to the no-fault benefits, while a victim whose medical expenses exceed \$10,000 may sue in tort as well. In other states, the thresholds are expressed in verbal terms, defining the severity of the injuries in general phrases such as (to use Michigan as an example) "death, serious impairment of bodily function, or permanent serious disfigurement".

Any threshold is inevitably somewhat arbitrary. However, with only rare exceptions, the American courts have held that it is a legitimate legislative purpose to deny the tort action for minor injuries while retaining it for major injuries. The removal of numerous minor tort claims from the system helps to fund the universal no-fault benefits, which typically do not extend to non-economic loss. The retention of the tort action for serious injuries provides damages for non-economic loss to those victims who are most in need of financial help - provided they can prove negligence. Accepting a rationale of this kind, the American courts have generally upheld both monetary and verbal thresholds as being a reasonable means of achieving a legitimate legislative purpose.

The cases are comprehensively described in Josephine Y. King, "Constitutionality of No Fault Jurisprudence," Utah L. Rev. no. 4 (1982):797.

Thresholds

I have just explained the prevalence in the United States of no-fault automobile insurance schemes which limit the tort action by statutory monetary or verbal thresholds. I have also explained that the American courts have generally upheld these thresholds, despite their inevitably arbitrary character. I am inclined to think that Canadian courts would take the same view. However, there is no doubt that a threshold is the most vulnerable part of a no-fault automobile insurance scheme. From a constitutional standpoint, it would be preferable to either leave the tort action intact or to abolish the tort action altogether. If it is determined to recommend the retention of the tort action only for serious injuries, then this policy should be thoroughly justified with reasons. In assessing the validity of a no-fault insurance scheme, a court would pay attention to the rationale for the scheme as set out in the report that proposed the scheme. This point is elaborated later in my discussion of s. 1 of the Charter.

Termination of Benefits At Age 65

Among the subsidiary points that I have been instructed to address is the question whether a loss-of-income indemnity could terminate at age 65, as has been proposed to the Inquiry by the Insurance Bureau of Canada. The rationale for such a termination date would be, no doubt, that 65 is now the usual retirement age when earned income would cease, and when public income-support and tax-assisted private income-support would start. The argument against such a termination date would be that the use of age as a cut-off point seems to infringe s. 15 of the Charter, which explicitly lists "age" as a prohibited ground of discrimination.

This issue raises a similar constitutional question to that raised by mandatory retirement, which has been attacked as infringing s. 15 of the Charter. In both Harison v. University of British Columbia (1986), 30 D.L.R. (4th) 206 (B.C.S.C.) and Re McKinney and University of Guelph (1986), 57 O.R. (2d) 1 (Ont. H.C.), courts have sustained university mandatory retirement rules on the basis that it is reasonable to stipulate an age when public and private pension benefits should become payable, and when older workers should give way to younger workers.

The Harrison case used this reasoning to deny that mandatory retirement infringed s. 15. The McKinney case held that mandatory retirement infringed s. 15, but that it was saved by s. 1.

Both of the mandatory retirement cases are only at the trial level, and both cases arose in a university context which introduced some special considerations. Nonetheless, in my judgment, the decisions are likely to be upheld by higher courts, and in other contexts as well. I think that the social benefits of mandatory retirement will be held to be sufficiently compelling to overcome the age classification that is entailed. I note as well that mandatory retirement has been upheld in the United States (Massachusetts Board of Retirement v. Murgia (1976), 427 U.S. 307), and that it is to be found in the judicature provisions of Canada's constitution itself (Constitution Act, 1867, s. 99(2), requiring superior court judges to retire at age 75).

I conclude that the use of age 65 as a cut-off point for a loss-of-income indemnity would probably be held not to offend s. 15 or at least to be justified under s. 1. Obviously, in view of the express mention of age in s. 15 and the absence of rulings by higher courts, it is not possible to be completely confident on this point, and the use of a criterion other than a stipulated age, if that is possible, would be safer from a constitutional standpoint.

Housekeeper Allowances

I do not believe that any constitutional problem is likely to be caused by provision for the indemnity of those who are working outside the market economy: students and housekeepers are the most obvious classes. If compensation is generally to be measured by loss of income, those who have no income inevitably have to be compensated on some essentially arbitrary basis, based on qualifications, future expectations or averages. It seems to me that any bona fide attempt to deal fairly with such cases, even though they are predominantly composed of people characterized by young age (students) or female sex (housekeepers), would not be held to be a violation of s. 15.

Conclusion on s. 15

I conclude that s. 15 is not an impediment to a no-fault insurance scheme for automobile accidents, even though it would treat the victims of automobile accidents differently from the victims of other accidents. The constitutional position would be exactly the same as that of workers' compensation which in my view also does not violate s. 15. I also consider, although I acknowledge some doubt, that a statutory threshold, whether monetary or verbal, for the retention of the tort action, would not violate s. 15.

SECTION 1 OF THE CHARTER

Text of s. 1

In earlier sections of this opinion I have given my opinion that a system of no-fault automobile insurance would not violate s. 7 or s. 15 of the Charter of Rights. If I am right, there is no need to consider s. 1 of the Charter. However, I will briefly consider s. 1.

Section 1 of the Charter provides as follows:

The Canadian Charter of Rights and Freedoms guarantees the rights and freedoms set out in it subject only to such reasonable limits prescribed by law as can be demonstrably justified in a free and democratic society.

Section 1 operates to save a law that is in conflict with a Charter right, provided that the law is a "reasonable limit" on the right, and that the law "can be demonstrably justified in a free and democratic society".

The Oakes Case

In R. v. Oakes, [1986] 1 S.C.R. 103, the Supreme Court of Canada propounded the criteria of reasonableness and demonstrable justification that had to be satisfied in order to bring a law within s. 1. First, the objective of the law must be "of sufficient importance to warrant overriding a constitutionally protected right or freedom" (p. 138). Secondly, once a sufficiently important objective is recognized, the means adopted by the law must be pro-

portional to the objective. This requires that the law (1) "be carefully designed to achieve the objective", (2) must "impair as little as possible the right in question", and (3) must not be disproportionately severe in its impact on the person whose right is limited (pp. 139-140).

Application to No-fault Scheme

The first element of the Oakes test is an assessment of the importance of the objective of the impugned law. In my opinion, the Supreme Court of Canada would hold that the provision of speedy, predictable and universal insurance coverage to accident victims is a sufficiently important objective. It is true that the coverage need not be confined to automobile accident victims, but the history in Ontario and elsewhere of distinctive treatment of industrial accidents and automobile accidents would not be ignored by the Supreme Court of Canada. Reform has always proceeded in stages, and the Court will defer to any reasonable judgment of the Legislature in its determination of how far to go in correcting a social problem. This is illustrated by Edwards Books and Art v. The Queen, [1986] 2 S.C.R. 713, where the Court held that Ontario's Sunday-closing law, although a limit on freedom of religion, was justified under s. 1 by the secular purpose of providing a 'pause day'. This justification was accepted, despite the fact that the law applied only to retail stores, not to other kinds of businesses.

The second element of the Oakes test is that the means employed must be proportional to the objective. This is difficult to deal with hypothetically without an actual draft law to examine, but there seems no reason to doubt that a no-fault insurance plan which provided compensation for all victims of automobile accidents would be held to satisfy the threefold test of proportionality. If the tort action were abolished in whole or in part, this could be justified as relieving the insurance plan (and thus all car owners) of costs that could be used to enrich the universal coverage.

While the burden of proving the elements of justification under s. 1 rests with the government or other proponent of the legislation, the Supreme Court of Canada has not in practice insisted upon much evidence to support laws the purpose of which was reasonably obvious. In the

Edwards case, for example, the Court relied almost exclusively on a report of the Ontario Law Reform Commission that had recommended the enactment of the Sunday-closing law. In the case of no-fault insurance, the report of this Inquiry, as well as any commissioned studies, will all be admissible to establish the rationale of whatever scheme is proposed. Assuming that the Inquiry succeeds in making a powerful case for whatever scheme it proposes, it seems almost certain to me that a court would hold that the requirements of s. 1 of the Charter had been sufficiently established.

Conclusion on s. 1

I conclude that, if (contrary to my opinion) the constitutional inquiry were to advance to a consideration of s. 1 of the Charter, a system of no-fault automobile insurance, including a system that replaced the tort action, would be held to be justified under s. 1.

CONCLUSIONS

1. My general conclusion is that the Ontario Legislature has the constitutional authority to enact a no-fault automobile insurance scheme, under which benefits to accident victims would be less than common-law damages, and under which the tort action would be wholly or partially abrogated.
2. The Legislature's power derives from its authority over "property and civil rights in the province": s. 92(13) of the Constitution Act, 1867. See p. 315, above.
3. The power to adjudicate claims under a no-fault scheme may be entrusted to an administrative tribunal, without any violation of s. 96 of the Constitution Act, 1867. See pp. 315-316, above.
4. The right to sue in tort is probably not within the words 'liberty' or 'security of the person' in s. 7 of the Charter, but, if it is, the substitution of no-fault liability would not be a breach of "the principles of fundamental justice". Therefore, s. 7 of the Charter is not an impediment to the complete or partial abrogation of the right to sue in tort. See pp. 316-320, above.

5. The singling out of automobile accident victims for treatment that is different from that of other kinds of victims can be justified as 'reasonable' and 'fair', and accordingly is not a breach of s. 15 of the Charter. See pp. 320-330, above.

6. The use of a 'threshold', whether monetary or verbal, to deny the tort action for minor injuries while retaining it for major injuries, is probably also not a breach of s. 15 of the Charter. See p. 328, above.

7. The use of age 65 as the termination point for payment of a loss-of-income indemnity is probably also not a breach of s. 15 of the Charter. See pp. 328-330, above.

8. Housekeeper allowances and benefits for students or other people working outside the market economy will have to be fixed on some basis other than actual loss of income. A bona fide attempt to deal fairly with such cases would not be a breach of s. 15 of the Charter. See pp. 329-330, above.

9. If, contrary to my opinion, a no-fault insurance scheme for automobile accidents were held to infringe s. 7 or s. 15 of the Charter, the scheme would be held to be justified under s. 1 of the Charter. In this conclusion, I assume that the scheme would follow the general lines suggested early in this opinion, that the scheme would follow in detail the recommendations of this Inquiry, and that the report of the Inquiry would make a powerful case in policy for the scheme. See pp. 330-332, above.

ADDENDUM

NOTE ON PUBLIC TRUSTEE (ALTA.)

WORKERS' COMPENSATION BOARD

The Decision

In Public Trustee (Alta.) v. Workers' Compensation Board (Alta. Q.B., August 13, 1987), Bracco J. of the Alberta Court of Queen's Bench held that the provision the Alberta Workers' Compensation Act that prevents an injured insured worker from suing a third party employer is contrary to ss. 7 and 15 of the Charter. I understand that this third party employer provision exists in all provincial workers' compensation statutes.

Section 7

With respect to s. 7, Bracco J. holds that the denial of the tort action against the third party employer is a violation of liberty (p. 28) and security of the person (p. 29) in breach of the principles of fundamental justice. He is not very clear about the applicable principle of fundamental justice, but seems to find it in a 'fair exchange' principle (p. 30): he says that a worker gets nothing in return for the denial of the action against the third party.

Assuming that there is a 'fair exchange' principle, it seems hard to argue that it has been broken here. Workers receive the benefit of a scheme of no-fault insurance in return for the loss of the tort action. The denial of the tort action against third party employers removes from the system some of the costs associated with the fault inquiry and frees resources to enrich the no-fault benefits that can be provided. Bracco J. points out that the City of Calgary had to carry liability insurance anyway, because the operation of the rail service created public risks. That is true, but most employers are not similarly exposed, and even the City of Calgary's risks (and therefore its costs of liability insurance) are reduced by the third

party employer immunity in the Workers' Compensation Act.

Assuming that Bracco J. is right, and that there has been no fair exchange here, is the fair exchange principle a principle of fundamental justice? I think not, for the reasons given in my opinion of June 23, 1987 at pp. 10-11. I do not think it is a 'basic tenet' of our legal system that every change in the law of torts must provide a 'fair exchange' to persons who lose potential (not actual, be it noted) causes of action. Nor do I think it is a 'basic tenet' of the legal system that tort liability must always be premised on fault. Certainly, these ideas find no support whatever in ss. 8 to 14 of the Charter which, according to Lamer J. in the B.C. Motor Vehicle case, provide "an invaluable key" to the identification of the basic tenets of the legal system.

Section 15

With respect to s. 15, Bracco J. holds that it is a breach of s. 15 for the law to deny to a worker a tort action against the negligent third party employer when a non-worker would possess the cause of action (pp. 34-35). In this ruling, Bracco J. follows the Piercey case (p. 33). But, as I argued in my opinion at pp. 21-22, there is a rational basis for limiting tort actions by workers: they have been granted a right to compensation which has not been granted to non-workers. I believe that this is an answer to the discrimination point.

Conclusion

From the point of view of a proposal for a no-fault automobile insurance plan, Bracco J.'s decision makes two disturbing points. One is that there is constitutional protection under s. 7 for the existing body of tort law. The other is that by reason of s. 15 the law cannot single out groups of accident victims (industrial victims, highway victims) for special treatment. Both these ideas were carefully examined and rejected in my opinion of June 23. I am satisfied that Bracco J. introduces no new considerations to the two points, and that his decision is wrong on both points.

Peter W. Hogg, Q.C.
September 22, 1987.

COMPENSATION FOR AUTOMOBILE
ACCIDENT VICTIMS IN ONTARIO:
A SIMULATION

Prepared for the Inquiry Into Motor
Vehicle Accident Compensation in Ontario

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SUMMARY

Introduction

Automobile accidents are a major cause of injury and death in Ontario, yet relatively little is known about the financial consequences of accidents or the pattern or extent of compensation for financial loss. This study combines data from a number of sources in order to stimulate the financial impact on those who are injured or killed in Ontario. The computer model that was generated can be used for determining the cost of alternative insurance systems.

The current system of compensation consists of a number of components: Workers' Compensation, the Canada Pension Plan, Unemployment Insurance, employer benefits, Schedule B benefits included with all automobile insurance, tort damages, and income-tested social assistance or welfare programs. Each of these systems has different eligibility criteria, benefit levels, and tax treatment. Consequently, many observers have claimed that the overall system of compensation may under-insure some victims and over-insure others. The primary focus of this study is to examine the relationship between benefit levels and lost income (or lost time) in order to determine the extent of insurance coverage that is being provided. The study analyses programs that offer benefits for loss of ability to work or to engage in normal activities, not those programs that provide medical benefits or rehabilitation for victims. The model of compensation for automobile accident victims provides a useful tool for evaluation compensation for lost time but does not seek to measure non-pecuniary losses or other costs of injuries or death. Furthermore, the model does not capture the administrative costs of the compensation system or the deterrence that might be provided by the fault-based tort system.

The Model

The simulation model was created by combining data on 172,514 persons in Ontario from the 1981 Census of Canada with information on the characteristics of accident victims in Ontario in 1985 obtained from the Ministry of Transportation and Communications. The resulting data base of 110,103 automobile accident victims should have the same characteristics as the actual acci-

dent victims in 1985. Information from several sources on the duration of disability was used to impute the amount of lost time for these victims. Finally, the provisions of the programs that provide compensation to victims were programmed in order to determine the compensation that each victim might receive. All calculations are made net of income taxes.

The model predicts that 60,637 persons in 1985 suffered injuries that prevented them from working or engaging in their ordinary activities. This loss is referred to as lost time. Of these, 40,549 lost more than one week and 1,198 were permanently disabled.

Injured persons who are unable to enjoy their usual activities can be said to have "lost time". This lost time may result in wage loss for those in the labour market, but those out of the labour market have real losses as well. Since the dollar value of this lost non-market time is not easy to calculate, an arbitrary value of \$140 per week is placed on lost time for those who are not in the labour market. The time loss for those in the labour market is valued with weekly earnings. Losses are measured with both wage loss and time loss.

In principle, complete compensation under tort law is paid when the victim is not at fault. Determination of fault in the model is based on the accident reports filed by the police officer at the scene of an accident. About 62% of those injured (with lost time) are not at fault while 44% of those killed are not at fault. These figures indicate that a majority of those injured can expect to receive some compensation from the tort system. A survey of bodily injury damage claims was undertaken by Joe Cheng at Eckler Partners Ltd. The claims data suggest that the amount paid for lost wages plus non-pecuniary losses decreases as a percentage of the value of lost wages. The relationship between lost wages and tort damages estimated from the Eckler claims data was used to impute the amount of tort damages in the stimulation model. Alternatively, tort damages were assumed to equal the value of lost time minus Accident Benefits.

Limitations of the Model

A model of this type naturally relies on many assumptions, some of which have important effects on the re-

sults. The modelling of the government programs should produce reasonably accurate estimates. The model does assume, however, that every victim pursues all of the benefits to which he/she is entitled (and not more). The assumptions concerning private sector coverage are based on incomplete information, but the magnitude of possible error is relatively small. The greatest source of potential error lies in the modelling of tort damages. It is likely that there is a much greater variance in the amount of actual tort compensation for a given loss than is captured in the model. Furthermore, tort compensation is available for partial disabilities, which are not recognized in the model.

The measurement of the adequacy of compensation depends on estimates of the loss as well as estimates of compensation. The duration of disability is only approximate, but errors in duration affect the aggregate estimates, not the individual estimates of the compensation to loss ratio for a given duration. The use of census data for individuals allows one to make reasonable estimates of the size of the after-tax wage loss, but the time-loss measure is based on an arbitrary value of time for those not in the labour force.

The Pattern of Compensation for Injuries

The simulation of victim compensation generates the present value of losses and the present value of compensation at the date of the accident. Table S-1 summarizes the aggregate losses and compensation as predicted by the model. Tort damages were imputed according to the equation estimated with the Eckler data.¹ The total after-tax loss of wages was \$311 million and the value of lost time was \$640 million. The after-tax compensation was \$628 million, nearly equal to the value of the lost time. This surprising result supports the view that the total compensation paid in the current system is adequate but that it needs to be redistributed so as to more closely match each individual's loss. Of course, this view does not take account of the deterrence objective of tort compensation. A total of \$203 million, a third of the total, is paid to individuals in excess of the value of their lost time.

TABLE S-1Sources of Compensation For Injured

Tort Damages	\$ 375,358,000	
Accident Benefits	90,324,000	
Long Term Disability	60,425,000	
Short Term Disability and Sick Leave	48,249,000	
Canada Pension Plan	46,309,000	
Unemployment Insurance	21,183,000	
Workers' Compensation	16,921,000	
Welfare (GAINS-D)	3,807,000	
Total Compensation	662,476,000	
- Taxes on Benefits	- <u>34,744,800</u>	
Compensation After Tax	627,732,000	
Compensation/Wage Loss		2.02
Wage Loss After Tax	310,943,000	
Compensation/Time Loss		0.98
Time Loss After Tax	639,880,000	

Tort damages are the largest source of benefits, contributing 57% of total gross benefits. The benefits are particularly important for those who are not full-time members of the labour force. With the exception of twelve weeks of benefits payable to a homemaker under the Accident Benefits coverage, tort compensation is the only source of compensation for those not in the labour force.

The current principles of tort damages do not permit the deduction of collateral benefits from the damages otherwise payable, with the exception of Accident Benefits. Consequently, the total compensation can exceed the total loss. If tort damages for lost earnings plus non-pecuniary loss were limited to the after-tax value of lost time, tort damages would fall from \$375 million to \$231 million, a decrease of \$144 million. In order to implement such a change in the method of damage assessment the present value of future benefits from all sources would have to be calculated.

Table S-2 presents the number of victims who are covered by alternative programs. Many of those covered by a particular program may not receive benefits from that program because their duration of disability may not be sufficient or their other benefits may be sufficiently high that no benefits are payable. About 60% of the victims are eligible for tort damages and 73% of victims are covered by Accident Benefits. The percentages change if one looks at the subset of victims who have wage loss. Of those with wage loss, 87% are covered by Accident Benefits. The model predicts that 30% of those with wage loss are covered by private (group or individual) long term disability insurance. When Workers' Compensation is added to this, 34.4% of those with wage loss are reasonably well insured for long term disability. An even larger percentage is insured for short term disability. Either Unemployment Insurance or employer short term disability insurance (or sick leave) covers 83.6% of those with wage loss.

The pattern of replacement of lost wages varies significantly with the length of disability. As duration increases, the ratio of compensation to wage loss and the ratio of compensation to time loss fall dramatically (Table S-3). One reason for this is that short term income replacement tends to be more complete than long term disability insurance. Another reason is that unemployment

TABLE S-2Number and Percent of Injured Covered By Source

	Victims With Time Loss		Victims With Wage Loss	
	Number	% of Victims	Number	% of Victims
Tort Damages	36,326	59.9	23,655	55.6
Accident Benefits	38,167	62.9	35,983	87.4
Long Term Disability	12,377	20.4	12,377	30.1
Short Term Disability	11,792	19.4	11,792	28.7
Canada Pension Plan	38,294	63.2	39,365	95.7
Unemployment Insurance	22,601	37.3	22,601	54.9
Workers' Compensation	1,757	2.9	1,757	4.3
Welfare (Gains D)	70	0.1	57	0.1
TOTAL	60,637	100.0	41,147	100.0

TABLE S-3Compensation Ratio By Duration of Disability

Duration of Disability	<u>Compensation</u>		<u>Compensation</u>	
	Wage Loss		Time Loss	
(Weeks)	Tort Damages Estimated ^a	Tort Damages Equal Time Loss	Tort Damages Estimated ^a	Tort Damages Equal Time Loss
1	19.00	2.05	7.68	1.09
2	7.35	1.44	4.40	1.02
3-4	6.30	1.62	3.37	1.08
5-13	6.59	2.12	2.55	1.13
14-26	3.37	1.66	1.98	1.12
27-52	2.28	1.33	1.57	1.02
53-207	1.94	1.39	1.21	0.94
Permanent	2.03	2.80	0.66	0.88
ALL	9.80	1.88	4.24	1.08

^aEstimated from the Eckler Partners' claim survey.

insurance provides short term coverage for those without extensive employer benefits. A more important explanation lies in the pattern of tort compensation that was imputed from the Eckler Partners' claim data. Those with as little as one week of lost time will receive an estimated \$2,181 plus 46.7% of their lost earnings. This amount is free of income tax while the lost wages were taxed. As a result, the average ratio of compensation to wage loss is a surprising 19.0 for those with only one week of disability. This ratio falls to about two for those with long term disability. The average person with a permanent disability receives twice his/her actual wage loss when all the programs and income tax are taken into account.

Another reason why the replacement ratio for wages is high is that disability programs such as Accident Benefits, Unemployment Insurance and the Canada Pension Plan do not differentiate between part-year and full-year workers. Once eligibility is established, the victim can collect for each week in the year, even if he/she had worked only part-year in the past.² The wage loss figures are reduced by the fraction of the year not worked, thereby adding to the ratio.

The ratio of compensation to time loss is a more meaningful measure of the losses (although the value placed on lost time is arbitrary). The ratio of compensation to the value of time loss falls from 7.68 for those with one week of lost time to .66 for those with permanent disability. The latter figure is in line with the ratio provided in employer long term disability plans (but these are not necessarily indexed for inflation).

The pattern of compensation by duration of disability is particularly sensitive to the assumption made about tort compensation. If one assumes that tort damages³ equal the value of time loss minus accident benefits,³ the replacement ratio does not fall so dramatically with duration of disability (Table S-3).

The average replacement ratio conceals a wide variation in the percentage replacement. Only 10% of victims receive no compensation; 47% receive more than three times their time loss. This number is affected by the large number of victims with one or two weeks of lost time and several thousand dollars in damages for non-pecuniary loss. If one looks at the distribution for those with

permanent disability, about 9% receive no compensation and no one receives more than two times his/her time loss.

The group of victims with less than 25% compensation for lost time consists mostly of victims who were at fault and were therefore not eligible for tort damages. The bulk of the victims who are under-compensated are out of the labour force and are therefore likely to be ineligible for most of the insurance benefits. Of these, 56% are under age twenty, and the majority of these are male. Therefore, if one wanted to stereotype the uncompensated victim, he is a male teenager with little employment history who was driving negligently.

The Pattern of Compensation for Fatalities

When there is a fatality there is a third measure of loss, the loss to the survivors. This measure represents the pecuniary loss suffered by family members in the household, taking into account the savings from the reduction in the number of household members. It is not intended to measure the value that the survivors place on the victim.

The aggregate compensation (for) payable to survivors or the estates of those killed in motor vehicle accidents is shown in Table S-4. Given that the current basis for tort compensation is compensation of survivors, not replacement of lost earnings, tort compensation tends to be a smaller percentage of total wage loss and time loss. Furthermore, it is easier to provide private coverage for survivors' losses than it is to provide disability insurance because the latter has more moral hazard. Consequently, the private insurance arrangements, primarily different types of life insurance, provide a higher percentage of the total compensation. The total after-tax compensation exceeds the aggregate survivor losses but falls well short of compensating for the lost time of the deceased. It should be noted that for efficient deterrence, tort damages for wrongful death should be much higher and should at least equal the victim's time loss.

Tables S-5 and S-6 measure the number of victims whose survivors or estates receive benefits from alternative sources. The modest amount of accident benefits provides compensation in all cases not covered by workers' compensation.⁴ The Canada Pension Plan is predicted to

TABLE S-4Sources of Compensation For Survivors or Estates

Tort Damages	\$ 54,593,000	
Canada Pension Plan	27,386,000	
Group Life	14,330,000	
Accident Benefits	8,260,000	
Accidental Death and Dismemberment	8,264,000	
Workers' Compensation	5,571,000	
Survivor Income	2,574,000	
Welfare	1,265,000	
	<hr/>	
Total Compensation Before Tax	122,248,000	
Taxes	<hr/> - 5,359,000	
Total Compensation After Tax	116,889,000	
Total Survivor Loss	102,580,000	
Compensation/Survivor Loss		1.14
Total Wage Loss	212,789,000	
Compensation/Wage Loss		.55
Total Time Loss	412,712,000	
Compensation/Time Loss		.28

TABLE S-5

Number and Percent of Deceased Victims Receiving Benefits By Source

	All Victims		Victims With Wage Loss		Victims With Survivors	
	Number	% of Victims	Number	% of Victims	Number	% of Victims
Tort Damages	265	21.3	176	22.7	223	39.9
Accident Benefits	1,205	96.9	739	95.1	536	95.9
Group Life	254	20.4	247	31.8	180	32.2
Accidental Death and Dismemberment	143	11.5	140	18.0	98	17.5
Survivor Income	35	2.8	35	4.5	28	5.0
Canada Pension Plan	621	49.9	621	79.9	420	75.1
Workers' Compensation	39	3.1	38	4.9	23	4.1
Welfare	18	1.4	7	0.9	13	2.3
Total	1,244	100.0	777	100.0	559	100.0

TABLE S-6
Distribution of Compensation-Loss Ratio - Estates or Survivors

Compensation/Loss	Wage Loss		Time Loss		Survivor Loss	
	Number	%	Number	%	Number	%
No Loss	467	37.5	0	0.0	685	55.1
25% or Less	389	31.3	809	65.0	55	4.4
26-50%	122	9.8	178	14.3	86	6.9
51-75%	56	4.5	83	6.7	68	5.5
75-99%	39	3.1	68	5.5	35	2.8
100%	0	0.0	0	0.0	0	0.0
101-125%	42	3.4	48	3.9	24	1.9
126-150%	26	2.1	37	3.0	38	3.1
151-200%	41	3.3	21	1.7	89	7.2
201-300%	34	2.7	0	0.0	91	7.3
300% and Over	28	2.3	0	0.0	73	5.9
All	1,244	100.0	1,244	100.0	1,244	100.0

provide benefits to 75% of those with survivors. The relatively low percentage of victims with survivors who receive tort benefits is due, in part, to the higher percentage of drivers who are at fault in fatal accidents compared to non-fatal accidents.

Survivor loss is much smaller than the other two loss measures. Consequently, the compensation to loss ratio is highest for this measure. In fact, the aggregate compensation exceeds the aggregate survivor loss by 12% (Table S-4). The compensation is only 28% of the value of time loss, which is not surprising given that the rationale for the Family Law Act provisions for wrongful death are intended to compensate survivors, not deter accidents. Fifty-five per cent of the deaths do not give rise to survivor loss. Only 11% of the deaths result in compensation of survivor loss below 50%, but these cases represent about one quarter of the total deaths with survivors.

Cost of No-Fault Benefits

The model is well-suited to forecasting the cost of any alternative compensation system. However, there is no behavioural response built into the model. That is, a generous compensation system would increase the number of lost time injuries and increase the duration of disability. It should also be noted that administrative costs are not included in the estimates. One of the claimed advantages of switching from a fault system to a no-fault system is a reduction in administrative costs.

Consider first a program that would eliminate tort compensation (and Accident Benefits) entirely and would offer primary coverage to all victims of automobile accidents. The benefits would be 90% of after-tax earnings up to a maximum benefit of \$30,000 per year. The minimum benefit would be \$140 per week (\$7,280 per year) for all victims. For those injured prior to age 65 the benefits would be equal to \$7,280 after age 65. For those injured after 65, benefits would equal 90% of lost earnings (up to the maximum) for life. This program would cost \$519 million or \$99 per vehicle.⁵ Against this cost one could deduct \$90 million in Accident Benefits and \$375 million in tort benefits, for a net additional cost of \$54 million or \$10 per vehicle. There would be substantial savings in other programs (which would provide secondary coverage) to the extent that they would be integrated with

the no-fault automobile insurance. These savings would not show up in reduced motor vehicle insurance premiums.

An alternative no-fault system would eliminate tort claims for those falling below some threshold of loss. The threshold might be those with continuing losses, evaluated at the end of the fourth year after the accident. That is, those not permanently disabled would collect from the no-fault system and would not be able to file a tort claim. Those permanently disabled would sue for the future losses only, evaluated at the end of the fourth year after the accident. For the first four years the permanently disabled victim would collect from the no-fault benefit program just described.

This proposed system would reduce tort claims from 35,550 per year to 770. It would universally compensate victims for a limited period of time. At the end of this period those claiming permanent losses and who were not at fault would have to demonstrate permanent disability in an adversarial process. The advantage of using tort damages for permanent losses is that tort damages are able to take into account losses that are difficult to deal with in a rigid no-fault insurance system. The use of lump sum tort damages for long term disability also has the advantage of eliminating the long term disincentive for rehabilitation inherent in any periodic payments system. It is estimated that the average tort claim for lost time and non-pecuniary loss would be \$168,000 under the proposed system, compared to \$10,559 under the current system.

The permanent loss threshold system is predicted to cost \$225 million (Table S-7). The tort damages for injury would fall by \$241 million (from \$335 million to \$134 million)⁶ and the accident benefits would fall by \$90 million, giving a net saving of \$106 million or about \$20 per vehicle. In addition there would be savings of \$134 million in other programs, provided they all chose to integrate with the automobile benefits, which seems likely in the case of private insurance and workers' compensation. Integration may be more difficult to achieve for federal programs such as Unemployment Insurance and the Canada Pension Plan. The net reduction in the cost of compensating injured victims would be \$240 million or \$44 per vehicle.

TABLE S-7Costs of A Threshold System For Personal InjuriesNo-Fault Benefits Paid For Four Years, Tort Thereafter

	Aggregate (million \$)	Per Vehicle (\$)
Gross Benefits	225	43
Change In Cost Of		
Accident Benefits	- 90	- 17
Tort Damages	- 241	- 46
	<hr/>	<hr/>
Net Cost	- 106	- 20
Change In Cost Of WC, CPP, LTD, STD, and UI	- 134	- 26
	<hr/>	<hr/>
Net Cost	- 240	- 46

Note: These figures do not take into account compensation for medical expenses. The tort figures include non-pecuniary loss and compensation for lost earnings only.

The savings realized would not necessarily represent a gain from society's point of view. From an insurance perspective there would be benefits because compensation would more nearly reflect losses for many individuals who are currently over-insured or under-insured. There would be additional benefits if the proposed system could be administered at a lower cost than the current system.⁷ The social cost of the change would be the result of reduced incentives to take care when driving. The reduced incentives would occur because the fault-based compensation would become a smaller percentage of total compensation.

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I. INTRODUCTION

Automobile accidents are a major cause of injury and death in Ontario, yet relatively little is known about the financial consequences of accidents for those injured or for the survivors of those killed. Significant amounts of compensation are paid to victims through public and private insurance programs and the tort system, yet little is known about the pattern or extent of compensation compared to the financial loss.⁸ This study combines data from a number of sources in order to simulate the financial impact on those who are injured or killed in Ontario. The computer model that was generated can be used for determining the cost of alternative insurance systems.

The current system of compensation consists of a number of components: Workers' Compensation, the Canada Pension Plan, Unemployment Insurance, employer benefits, Schedule B benefits included with all automobile insurance, tort damages, and income-tested welfare programs. Each of these systems has different eligibility criteria, benefit levels and tax treatment. Consequently, many observers have claimed that the overall system of compensation may under-insure some victims and over-insure others. Furthermore, the administrative cost of providing benefits from so many sources may be larger than under a comprehensive insurance system such as no-fault automobile insurance. The primary focus of this study will be to examine the relationship between benefit levels and lost income, net of income taxes, in order to determine the extent of insurance coverage that is being provided. The study concentrates on programs that offer benefits for loss of ability to work or to engage in normal activities, not those programs that provide medical benefits or rehabilitation for victims.

The next section of the report will briefly describe the various programs that provide income to those with temporary or permanent disabilities and to dependants of those killed in motor vehicle accidents. It must be emphasized that the descriptions of the program structures are intended to provide an overview of the programs, not to provide an exhaustive list of all of the provisions.

II. SOURCES OF COMPENSATION FOR DISABILITY

A. Workers' Compensation

If a worker is injured in a motor vehicle accident in the course of his employment, he will be compensated through the workers' compensation system and will not be able to sue in tort. In 1985 there were 1,840 workers' compensation claims settled that resulted from injuries or death in motor vehicle accidents. This is a small percentage of total accidents, but workers' compensation is important in some occupations. For example, there is a greater than 60% chance that an injured individual, whose occupation is transport equipment operator, is covered by workers' compensation for his injury. Table II-1 presents the number of claims and the compensation under workers' compensation in 1985.

Workers' Compensation benefits are 90% of after-tax earnings up to a maximum benefit of \$444 per week. For those whose after-tax weekly wages are less than \$225 the benefits equal the after-tax weekly wage. The workers' compensation benefits are not taxable.

B. Canada Pension Plan

The Canada Pension Plan provides long term disability benefits for those who have contributed for at least two of the last three years or at least five of the previous ten years. The benefits are payable after a waiting period of three months. The applicant must be unable to secure regular, substantially gainful employment, and the disability must be prolonged. The weekly benefits are \$56 plus approximately 19% of earnings up to a maximum benefit of \$146 per week. At age 65 the recipient receives retirement benefits. The children of disabled contributors receive about \$22 per week until age 18 (or age 25 if they remain full-time students). In 1986, 1,259 of 18,460 new disability pension recipients in Ontario were disabled because of accidents, poisoning or violence.⁹ It is not known what percentage of these disabilities were caused by motor vehicle accidents.

TABLE II-1Workers' Compensation Claims and Compensation^aMotor Vehicle Accidents Settled In 1985

	<u>Claims</u>	<u>Compensation</u>
Injuries		
Temporary	1,693	\$ 4,212,419
Permanent	<u>125</u>	<u>8,117,352</u>
Total	1,818	\$ 12,329,771
Fatalities	22	\$ 1,992,583

^a The Compensation is the present value of a claim.

Source: Ontario Workers' Compensation Board.

C. Group Long Term Disability

There is a significant amount of income replacement insurance that is provided by or arranged by employers. A much smaller amount of such insurance is sold to individuals. Information on the extent of such coverage is available through life insurers who underwrite most of the long term disability insurance, employee benefit consulting firms who survey employer practices, and surveys of collective agreements. None of these sources provide the precise information necessary to determine the extent of coverage in Ontario. The life insurance figures do not identify the industry and do not include income replacement that is self-insured by employers. The benefit surveys and the collective agreements surveys tend to concentrate on larger firms. The gaps in private coverage are likely to occur in small firms and low wage sectors of the economy.

The Canadian Life and Health Insurance Association reports that its members were covering 801,436 employees for short term income replacement and 1,508,150 persons for long term income replacement in Ontario in 1985.¹⁰ In addition, 139,848 persons were insured through individual income replacement plans. The total number of persons covered for long term disability, 1,647,998, is 40.7% of full-time employees in Ontario. The figure for short term coverage is incomplete because a substantial number of organizations provide short term sick leave without purchasing insurance. The compensation surveys suggest that the extent of short term coverage is at least as great as the extent of long term coverage.

Table II-2 presents the percentage of coverage for various plans as reported in five surveys. The long term disability coverage is very high in managerial and office employment and lower in unionized employment. The benefits typically replace 60 to 70% of wages but are not completely indexed for inflation. The benefits are taxable if the employer contributed to the premiums.

TABLE II-2

Percentage of Employees Covered By Insurance For Disability or Death

	Short Term			Long Term	Group Life	Accid. Death	Survivor Income
	Sick Leave	Indemnity	Both				
^a							
Pay Research Bureau							
Management/Professional Office	93.7	0.2	5.6	96.0	100.0	62.0	27.4
Non-Office	86.6	0.9	11.5	86.6	99.2	59.0	25.1
	46.4	40.1	11.3	72.6	95.5	65.0	13.1
Major Collective Agreements, Ontario ^b	34.8	30.5	-	36.9	71.3	26.5	10.6
Board of Trade of Metropolitan Toronto ^c	-	-	82.0	94.0	98.0	90.0	25.0
^d							
Executive Compensation Service	-	-	88.2	78.4	100.0	86.3	-
Top Managers	-	-	86.1	84.7	100.0	83.3	-
Middle Managers	-	-	83.7	77.6	100.0	87.8	-
Professional and Technical	-	-	78.9	71.1	94.7	84.2	-
Sales Office	-	-	85.7	77.8	96.0	84.9	-
Canadian Manufacturers' Association ^e	-	-	95.8	96.5	99.7	84.6	61.0
(Ont.)	-	-	97.6	77.4	99.6	89.8	62.5
Salaried Hourly-Paid							

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TABLE II-2 (Continued)

- a Pay Research Bureau, Employee Benefits and Working Conditions Canada, 1986, Ottawa: 1987.
- b Canada, Ministry of Labour, Provisions in Major Collective Agreements, unpublished data, June, 1987.
- c Board of Trade of Metropolitan Toronto, 1986 Executive Compensation Survey for the Greater Metropolitan Toronto Area. Survey of 181 organizations, of which 52 had under 100 employees.
- d Executive Compensation Service, Executive Remuneration - Canada 1986/87; Professional, Sales & Technical Remuneration - Canada 1986/87; Office Personnel Remuneration - Canada 1986/87. Data as of June 1, 1986.
- e Canadian Manufacturers' Association, Ontario Division, Salaries and Working Conditions of Office and Other Selected Salaried Employees In Ontario, 1986; Wages and Working Conditions of Hourly-Paid Employees in Ontario, 1986.

D. Group Short-Term Disability and Sick Leave

Short-term income protection is either provided through an explicit insurance arrangement, called a weekly indemnity, or through sick leave, which is self-insured by the employer. The weekly indemnity plans are more common in blue-collar occupations. Weekly indemnity programs may offer less than full pay, but sick leave is likely to provide full pay for a specified period. To the extent that some plans allow accumulation of unused sick leave, the compensation is not really insurance. An automobile accident victim who cannot work for a period of time would lose sick leave credits and therefore would not really be compensated for his/her loss or earnings.

E. Unemployment Insurance

Unemployment Insurance sickness benefits are payable to those with more than 20 weeks of employment during the previous 52 weeks. The self-employed and those earning less than \$106 (and working less than 15 hours per week) are not covered by unemployment insurance, and those covered by workers' compensation are excluded from receiving benefits. Employer sick leave and short term disability benefits are deducted from Unemployment Insurance sickness benefits. The benefits are payable for 15 weeks after a two week waiting period. The benefits equal 60% of the recipient's wage up to a maximum benefit of \$318 per week and are taxable.

F. Accident Benefits (Schedule B)

Benefits are payable under the standard Ontario motor vehicle insurance policy for lost earnings of the driver, passengers or others involved in an accident. The benefits are payable regardless of the fault, with an exception for suicides and impaired driving. The income replacement benefits, generally 80% of the weekly wage up to a maximum benefit of \$140 per week, are payable for someone who is employed at the time of the accident or was employed six of the previous twelve months.¹¹ The definition of disability changes two years after the accident. Prior to that time the insured person must be unable to perform "the essential duties of his occupation or employment." After two years he must be unable to engage in "any occupation or employment for which he is reasonably suited by education, training, or experience."

Those receiving benefits for permanent disability can continue to receive the benefits for life. These benefits are not indexed for inflation.

The weekly benefit is reduced if the employee receives benefits from some other sources. For the first two weeks the benefits equal the minimum of \$140 or 80% of the weekly wage. Thereafter, the benefits are 80% of the weekly wage, minus benefits from other sources. The benefits are not taxable.

A 'principal unpaid housekeeper' may receive \$70 per week for 12 weeks if he/she is completely incapacitated.

G. Tort

Victims who can prove that another party, usually a driver, was negligent ('at fault') can collect damages in court. These damages are reduced to the extent that the victim is also negligent. The tort damages can be substantial compared to most benefit programs. The victim is in principle entitled to enough damages to make him/her 'whole', but the Supreme Court of Canada has placed a ceiling on the amount of damages for non-pecuniary loss (about \$200,000). The damages are payable in a lump sum form, unless the parties agree to periodic payments (a 'structured settlement'). The victim must usually hire a lawyer to pursue his/her claim if the damages are significant.

H. Welfare

There are numerous income-tested and asset-tested programs for those with few resources. GAINS-D is the major program for the disabled in Ontario. The benefits vary with the special needs of the recipient, but the weekly amount is about \$151 per week for a single person.

III. SOURCES OF COMPENSATION FOR SURVIVORS

A. Workers' Compensation

A lifetime pension is payable to the surviving spouse of a person covered by workers' compensation. The amount payable depends on the age of the surviving spouse and the presence of dependent children. A spouse with no children

receives 40% of net earnings, with an additional 1% for each year of age over 40 or with a reduction of 1% for each year of age under 40. A spouse with dependent children receives 90% of after-tax earnings until the youngest child reaches 19 years of age. At that time the age-related pension formula applies. Canada Pension Plan benefits are deducted from the covered earnings when the pension is calculated.

If there is no surviving spouse, the surviving children will receive a pension to age 19. This varies from 30% of after-tax earnings to 90%, depending on the number of children.

Funeral expenses of \$1,593 are paid and there is a lump sum death benefit to the spouse of \$42,470, adjusted for age. The death benefits range from \$21,235 to \$63,705. None of workers' compensation benefits are taxable.

B. Canada Pension Plan

The Canada Pension Plan provides benefits in the case of death for those who have contributed for three calendar years and at least one third of the years in their contributory period (or for at least 10 years). Death benefits equal approximately one and a half times the deceased's monthly earnings, up to a maximum of \$2,590. Survivor benefits depend on the spouse's age and the presence of dependent children. The weekly benefit is approximately \$22 plus 19% of the deceased's earnings, up to a maximum of about \$67 per week. When the spouse reaches age 65 the weekly benefit is 60% of the deceased contributor's retirement pension (about 15% of earnings). There are reductions in benefits for survivors under age 45 without dependent children. Each dependent child receives \$22 per week. Canada Pension Plan benefits are taxable.

C. Group Life Insurance, Death Benefits and Survivor Income

As indicated in Table II-2, group life insurance is very common. In addition there is often coverage for accidental death, despite the fact that the needs of the survivors are the same regardless of the cause of death. Employers will often allow employees to purchase additional life insurance coverage through the group plan. A less

common type of coverage provides income for a surviving spouse.

D. Accident Benefits (Schedule B)

The standard vehicle insurance policy provides benefits for those killed in a motor vehicle accident. Funeral expenses are payable up to \$1,000 (which is below the usual cost) and death benefits are payable to the survivors. Following the death of a head of a household, \$10,000 is payable plus \$1,000 for each dependant beyond the first. The amounts payable for the death of a spouse and dependant are \$10,000 and \$2,000, respectively.

E. Tort

The Family Law Act permits the survivors to file a tort claim upon the death of a family member. The survivors can collect the present value of the after-tax earnings of the deceased, less the amount assumed to be consumed by the deceased (usually about 30% in the case of a couple without children). Additional amounts are payable for future taxes that will be paid on the investment fund and for loss of "guidance, care and companionship".

F. Welfare

The death of a wage-earner could reduce a family's income and assets to below the maximum to qualify for various welfare programs. Furthermore, the death of the head of a household may make the surviving parent eligible for a program that is intended for single-parent families.¹²

IV. OVERVIEW OF MOTOR VEHICLE INJURIES

A. Ministry of Transportation

A detailed accident report is completed by the police at the scene of an accident. These reports contain a substantial amount of information concerning the type of accident, the vehicles involved, the persons involved, the extent of injury and the conduct of the driver and any pedestrian. These data are reported each year in the Ontario Road Safety Annual Report.

Table IV-1 presents some overall statistics on accidents in Ontario. In 1985, 109,169 persons were injured and 1,191 persons were killed in automobile accidents. The distribution of injuries by severity is shown in Table IV-2. Based on pieces of information from other sources, it seems likely that those with minor or major injuries plus about 20% of those with minimal injuries suffer some loss of time because of their injuries.

The probability of being injured is unusually high for young men. Table IV-3 presents the age pattern of injury by type of activity ('category of involved person'). In Table IV-4 the driver injuries and fatalities are presented as a percentage of the number of drivers in each age and sex category. The table illustrates the dramatic difference in the injury rate between young and old drivers and the differences between men and women.

The Ministry of Transportation and Communications generated a detailed set of tables from their data base for incorporation in the model of automobile injuries in Ontario. Section V of this report describes how this model was developed.

TABLE IV-1Selected Accident StatisticsOntario 1985Accidents

Total Reportable	189,750
Fatal	1,036
Personal Injury	73,840
Property Damage	114,874

Deaths

Drivers (Total)	603
Drivers (Impaired or Had Been Drinking)	285
Passengers	356
Pedestrians	182
Other Road Users	50
Total	1,191

<u>Persons Injured</u>	109,169
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Other Statistics

Estimated Ontario Population (1985)	9,066,000
Licensed Drivers	5,660,422
Registered Vehicles	5,218,392
Estimated Property Damage	\$547,518,951

Source: Ontario Ministry of Transportation and Communications, '85 Ontario Road Safety Report, pp. 8, 14.

TABLE IV-2

Category of Involved Persons By Severity of Injury 1985

Category of Involved Person	Severity of Injury					Total
	None	Minimal	Minor	Major	Fatal	
Driver	268,622	34,130	18,055	3,674	502	324,983
Passenger	179,515	20,207	12,962	2,548	333	215,565
Pedestrian	294	1,999	2,977	1,123	182	6,575
Motorcyclist	115	2,318	2,012	334	43	4,822
Moped Driver	-	10	15	3	1	29
Motorcycle Driver	864	1,957	2,393	977	97	6,288
Motorcycle Passenger	200	307	455	158	23	1,143
Other	7,009	229	175	151	10	7,574
Total	456,619	61,157	39,004	8,968	1,191	566,979

Source: Ontario Ministry of Transportation and Communications, '85 Ontario Road Safety Report, p. 14.

TABLE IV-3

Category of Persons Injured By Age Groups 1985

Age Groups

Category of Persons	0-4	5-15	16-19	20-24	25-34	35-54	55-64	65-74	75+	UnKn	Total
Driver	2	64	5,540	10,743	15,429	17,199	4,271	1,906	664	41	55,859
Passenger	1,493	5,007	5,403	6,320	6,275	6,411	2,335	1,444	691	338	35,717
Pedestrian	290	1,611	566	675	857	973	407	356	280	84	6,099
Motorcyclist	29	1,659	856	778	567	273	46	30	12	414	4,664
Moped Driver	-	-	1	6	7	8	3	2	1	-	28
Motorcycle Driver	-	16	1,461	2,030	1,255	516	38	11	-	-	5,327
Motorcycle Pass.	3	66	340	277	150	65	11	-	-	8	920
Other	10	145	113	57	76	57	16	4	9	68	555
Total	1,827	8,568	14,380	20,866	24,616	25,502	7,127	3,753	1,657	953	109,169

Source: Ontario Ministry of Transportation and Communications, '85 Ontario Road Safety Report, p. 16.

TABLE IV-4Driver Injury and Fatality Rate By Age and SexInjured and Killed As a Percentage of
Drivers In Each Group

Age	Male	Female	All
16-19	3.04	1.58	2.43
20-24	2.41	1.24	1.89
25-34	1.44	0.87	1.17
35-54	0.99	0.76	0.88
55-64	0.72	0.51	0.64
65+	0.56	0.42	0.51
All	1.31	0.83	1.10

Source: Ontario Ministry of Transportation and Communications, licence data from '85 Ontario Road Safety Report, p. 23, injury and fatality data from unpublished tabulation.

B. Ministry of Health

The Ontario Ministry of Health keeps detailed records on the cause and type of injury for those requiring hospitalization. The 1985 data indicate that 13,143 persons were hospitalized as a result of motor vehicle accident injuries. The average length of stay in the hospital was 10.8 days. Table IV-5 indicates the age-sex pattern of hospitalization.

It appears that the hospitalization data exclude many serious cases that ultimately lead to time loss. Given that the hospitalization figures appear to exclude most victims with lost time and at least two-thirds of those with more than one week of lost time, this source of data was not utilized in the simulation. Nevertheless, it might be possible in a future study to use these data to determine the extent of catastrophic injuries. For example, these data indicate that there were 52 hospital admissions with "fracture of vertebral columns with spinal cord lesion" in 1985.

C. Disability Surveys

1. Ontario Ministry of Health

In 1980 the ministry surveyed 15,948 dwellings in Ontario and identified 2,423 handicapped persons.¹³ Interviews were conducted on 1,764 handicapped persons. The handicapped were identified by the response to a question concerning 18 specific limitations. For example, the respondent was asked whether or not there was anyone in the household who "is unable to work at all or to work regularly" or "is deaf or has serious hearing problems".

The study identified 64 persons, or 3.8% of the sample, who reported that the primary cause of a first-mentioned physical problem was an "Accident in Travel".¹⁴ The other accident categories were "Work Accident" (8.5%) and "Home Accident" (4.3%). It is extremely difficult to generalize from such a small sample of possible automobile accident victims, but the survey does suggest that automobile accident victims are a small part of the total handicapped population. This survey did not include the institutionalized population.

TABLE IV-5Hospitalization of Victims of Motor Vehicle AccidentsOntario 1985, By Age and Sex

Age	Male	Female	Total	Average Number of Days
0-4	202	92	294	7
5-15	817	484	1,301	10
16-20	1,925	743	2,668	9
21-24	1,350	510	1,860	10
25-34	1,651	813	2,464	9
35-44	871	552	1,423	11
45-54	564	448	1,012	11
55-64	465	438	903	13
65-74	326	390	716	16
75+	235	244	479	20
Unknown	17	6	23	11
Total	8,423	4,720	13,143	11

Source: Ontario Ministry of Health.

2. Statistics Canada Health and Disability Survey

Statistics Canada surveyed 126,698 persons in 1983 and 1984 and identified 15,854 disabled persons.¹⁵ Disability was defined according to the World Health Organization definition as "any restriction or lack ... of ability to perform an activity in the manner or within the range considered normal for a human being."¹⁶ There were estimated to be 3.867 million disabled persons in Canada aged 15 and over.¹⁷ Of these, 575,000 were said to be caused by accidents, or 14.9%.¹⁸ In Ontario there were estimated to be 937,000 disabled persons. Multiplying .149 by 937,000 and applying the ratio of travel accidents to total accidents in the Ministry of Health survey gives an estimated population of disabled victims of travel accidents equal to $.149 \times 937,000 \times (64/281) = 31,798$. This total excludes those under age 15.

The model developed below contains rough estimates of the permanent disabilities caused per year. The model predicts that 1,198 persons will be permanently disabled each year. At the current rate of injury, with no change in the current population structure and no change in risk of injury, ultimately the number of individuals in the Ontario population who are permanently disabled as the result of automobile accidents would reach 54,491.¹⁹ This is probably an upper bound on the number of permanently disabled automobile accident victims in Ontario.

3. Statistics Canada Absence from Work Survey

Statistics Canada added a special survey to the Monthly Labour Force Survey in February of each year between 1979 and 1982. The sample consisted of one half of the full Labour Force Survey sample (which covers approximately 120,000 persons). The respondents were asked whether they were absent from work for more than two weeks during the previous year due to illness or accident and were asked about any compensation they may have received during this absence. The survey indicates that of 4,257,000 paid workers in Ontario in 1978-1981, 272,000, or 6.4%, were absent two or more weeks.²⁰ Of these, 80.1% received compensation.

This survey provides some information on the extent of coverage by employer sick leave or disability insurance. In Ontario 23.1% received group insurance and 30.0% re-

ceived partial or full pay from their employers. The sum of these percentages, 53.1%, may include some double counting,²¹ but the number tends to confirm other information on private disability coverage.

D. Green Book

The Insurance Bureau of Canada publishes data on the claims experience of motor vehicle insurance companies.²² Most of the data combine claims for property damage and bodily injury, but there is some information on the total cost of bodily injury claims. In 1985 the present value of bodily injury 'loss cost' per private passenger vehicle was \$162.85.²³ The estimated cost of bodily injury liability claims equals \$643 million for about 43,000 bodily injury claims (Table IV-6). These totals include compensation for all heads of damage, not just lost earnings. In the same year there were 20,632 claims (the number of claimants is larger) under the Accident Benefits provisions for loss of income, costing \$53,221,000.²⁴

E. Summary of Total Compensation

Table IV-6 summarizes the total amounts of compensation from various sources. In many cases, data are unavailable specifically for automobile accidents. The data also differ in the method of costing. Some are on an annual basis while others represent the present value of future payments.

V. DESCRIPTION OF THE MODEL

A. Creation of a Sample of Victims

No single data source contains enough information to determine the extent of compensation for injured victims. Therefore, it was necessary to create a data set by combining existing data sources. A flow chart of the data set creation process is shown in Figure V-1. The foundation for the data set is the 1981 Census of Canada. The census data are available at an individual (or family) level for a one in fifty sample of the population.²⁵ Data were available for 172,514 persons in Ontario. For each person, information is provided on many variables, including income and work activity in 1980. The complete list of variables from the census that were used in the model is provided in Table V-1.

TABLE IV-6Aggregate Compensation For Disability In Ontario

	Year	Total	Automobile
<u>Annual Payments</u>			
Short Term Disability ^a	1985	179,633,174	?
Long Term Disability ^a	1985	236,861,380	?
Unemployment Insurance ^b	1986	99,507,770	?
CPP (new beneficiaries) ^c	1986	4,732,300	322,750 ^d
Welfare (GAINS-D)	1986	431,400,000	?
<u>Present Value of Benefits For Those Injured In Year</u>			
Workers' Compensation ^e	1985	782,871,588	14,322,354
Accident Benefits ^f	1985-6	-	53,221,495
Tort Bodily Injury ^g	1985-6	-	643,305,000

^a Canada Life and Health Insurance Association, Survey of Health Insurance Benefits in Canada, 1985.

^b Statistics Canada, Unemployment Insurance Statistics, Cat. 73-001.

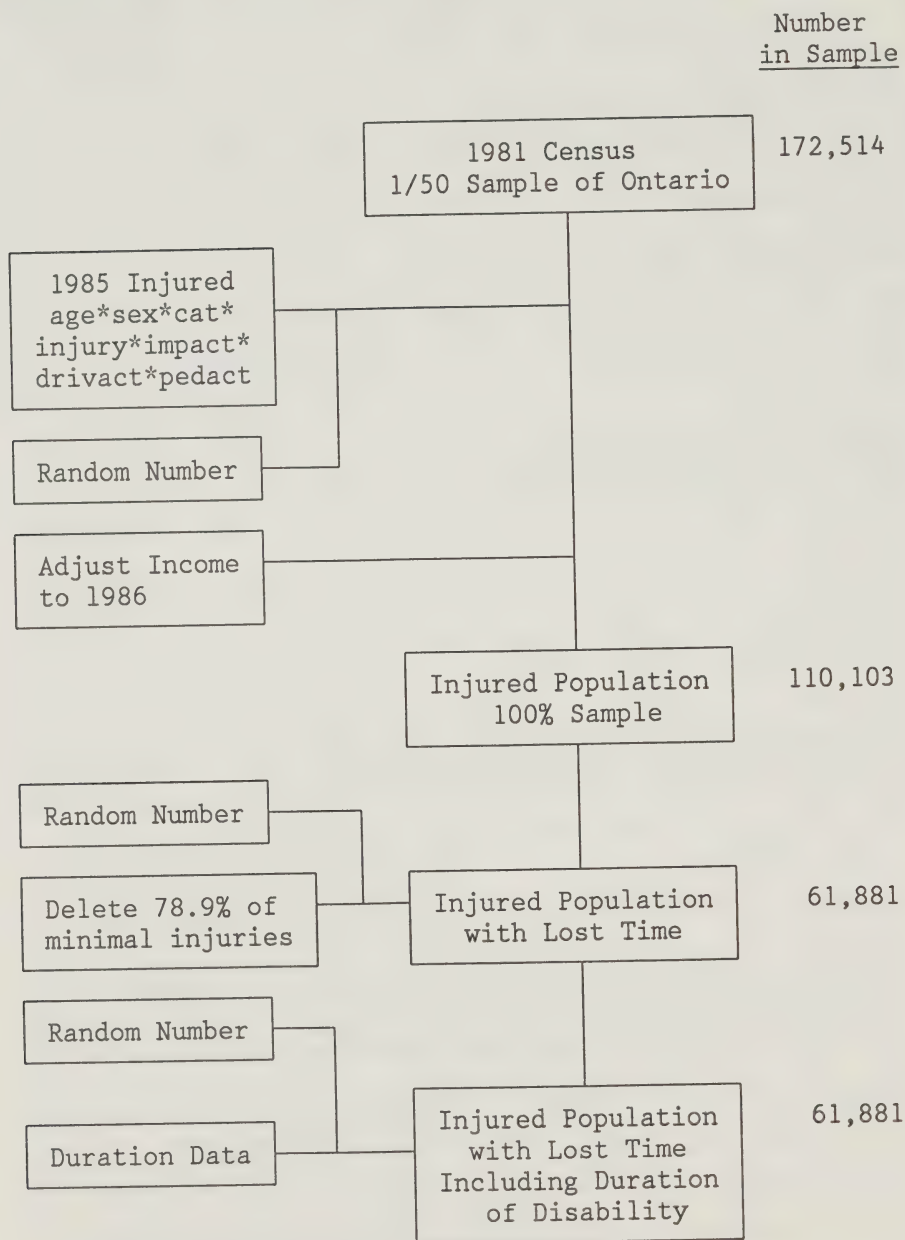
^c Unpublished data from Health and Welfare Canada.

^d This is an estimate of the amount paid to new claimants who were disabled because of accident, poisoning and violence. The Canada-wide proportion with such causes was multiplied by the Ontario benefits paid out.

^e Data provided by Workers' Compensation Board. The cost figures apply to claims settled in 1985.

^f Unpublished data from the Insurance Bureau of Canada.

^g Insurance Bureau of Canada, 1986 Automobile Insurance Experience, p. 290 multiplied by .7739 to convert to present value. The data refer to private passenger automobile claims.

FIGURE V-1Flow Chart For Construction Of Injured Population Data Set

Note: 1,244 fatalities are included in the injured population.

TABLE V-1Census Data Used In Model

Province

Age

Sex

Census Family Status

Number of Persons in Census Family

Total Census Family Income Group (1980 income)

Labour Force Activity (Week prior to June 3, 1981)

When Last Worked

Weeks Worked in 1980

Full-time or Part-time Weeks Worked in 1980

Occupation

Industry

Total Income in 1980

Wages and Salaries in 1980

Investment Income in 1980

Age of Husband or Father

Age of Wife or Mother

The Ministry of Transportation and Communications did a special cross-tabulation of persons injured in 1985. This produced the number of injured persons by age, sex, injury type, category of person (driver, pedestrian, etc.), impact type, driver action, and pedestrian action. The resulting seven-dimensional matrix contained 6,048 separate cells. Table V-2 indicates the variables provided by the Ministry of Transportation and Communications.

For any age and sex the probability of being in any of 482 cells (injury type, category of person, impact type, driver action, pedestrian action) could be calculated by comparing the number injured with the population in the particular age and sex group.²⁷ Random numbers were generated by the computer in order to assign a particular individual on the census data tape to one of these cells.²⁸ Of course, some individuals are randomly assigned to the 'not injured' category and are no longer considered in the analysis. The resulting sample is a 100% sample of the injured population in Ontario, based on 1985 injuries and fatalities. The total number of persons in the sample is 110,103. This total differs slightly from the Department of Transportation and Communications total (110,189) because of the random process used to assign injuries and death to individuals.²⁹

The total number of injured persons includes some victims who have relatively minor injuries which do not result in any time lost from their ordinary activities. Determining the number of victims without time loss is difficult, but there are two pieces of information to go on. First, a survey of accident victims conducted in 1981 found that 56.9% of those injured had lost time.³⁰ Of those with some lost time it has been assumed in the Insurance Bureau of Canada submission on no-fault insurance that one third lose less than one week.³¹ Applying these probabilities to the total number injured gives 60,637 persons with some lost time and 40,549 persons with more than one week of lost time.³²

The Regie de l'assurance automobile in Quebec has comprehensive data on those who are collecting indemnities for lost time. In Quebec 34.9% of the injured collect indemnities.³³ It is necessary to be disabled for more than one week to qualify for these benefits. As a rough cross-check of the number with more than one week note that 34.9% of 110,103 is 38,426, close to the figure derived above (40,549).

TABLE V-2Data From Injury StatisticsAge

0-15
 16-19
 20-24
 25-34
 35-54
 55-64
 65 and over

Sex

Female
 Male

Type of Injury

Minimal
 Minor
 Major
 Fatal

Category of Person

Driver of Private Passenger Vehicle incl. Motorcycle
 Driver of Other Vehicle
 Passenger
 Pedestrian or cyclist

Impact Type

Other Motor Vehicle
 Pedestrian or Cyclist
 Fixed object or other circumstances

Driver Action²⁶

Not Known
 Proper
 Improper

Pedestrian Action

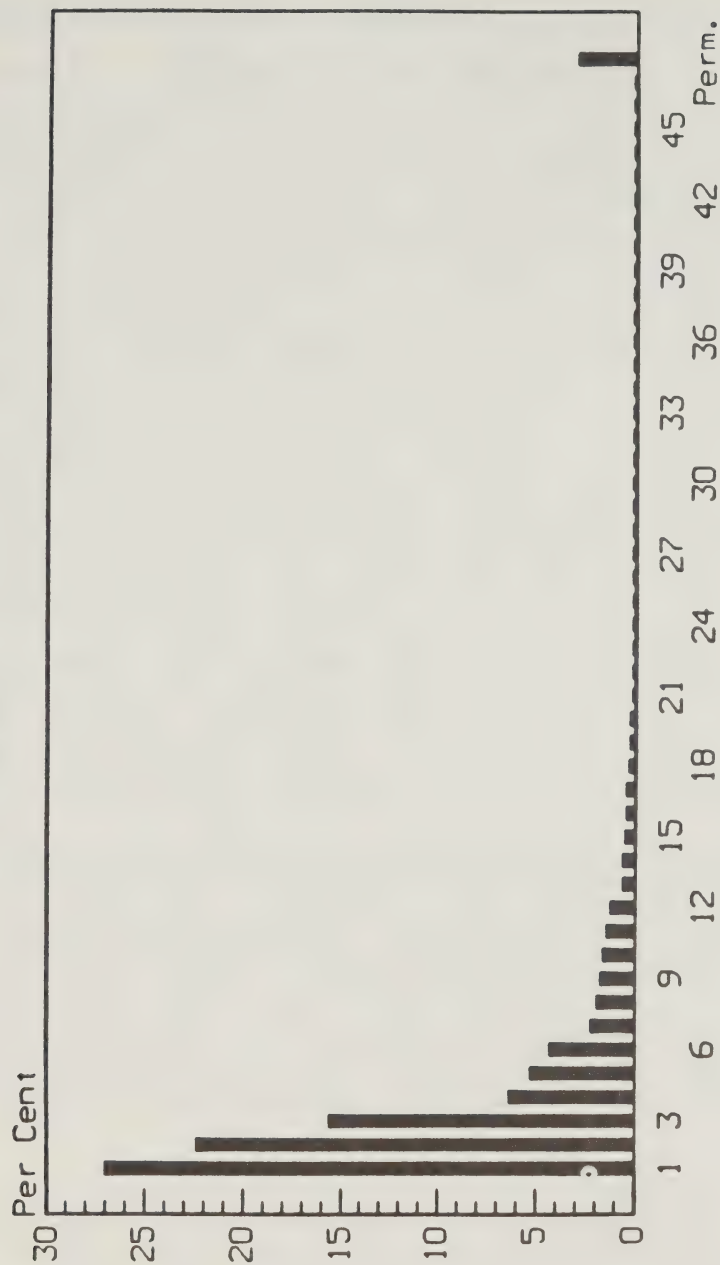
Not Known
 Proper
 Improper

After one week of disability, there is a rapid recovery for most victims. Only a very small fraction are still unable to work or carry out their normal activities after a few years have elapsed. The Quebec experience on duration of disability was applied to the Ontario injured population (Figure V-2). It should be recognized that the average duration will be increased in Quebec because of the universal indemnity.

Beginning with the population of injured persons, 56.9 per cent were retained in the sample because they lost time. The assignment of lost time was assumed to be concentrated amongst those with more serious injuries. This assumption implied that about 79% of those with minimal injuries had no lost time. One third of those with some lost time, concentrated among those with minimal or minor injuries, were assumed to have less than one week of lost time. The remainder was assigned a duration of disability based on a random number according to the probabilities experienced in Quebec. The resulting distribution of lost time is shown in Table V-3.

In this model there is no consideration of partial disability. A week of lost ability to engage in one's ordinary activities is assumed to be complete. In reality the extent of disability varies over a broad range, and any measure of economic loss should recognize that fact. However, most compensation schemes, with the exception of tort damages, do not deal satisfactorily with partial disability. There is usually some incentive for those with partial disabilities to claim total disability. Similarly, those with legitimate partial disabilities are frequently denied compensation. Consequently, the all or nothing assumption inherent in the model, although unsatisfactory from an economic point of view, may adequately mirror the way in which many compensation systems operate.

Distribution of Disability Duration Quebec Experience



Months

Figure V-2

TABLE V-3Assumed Duration of Disability

Weeks Disabled	Number	%
1	20,088	33.1
2	3,927	6.5
3	3,607	6.0
4	3,231	5.3
5 - 13	15,492	25.5
14 - 26	6,467	10.7
27 - 52	4,127	6.8
53 - 207	2,500	4.1
Permanent	1,198	2.0
ALL	60,637	100.0

B. Calculation of Victim Losses

1. Injured

Injured victims may suffer several types of losses. They may have pain, out of pocket expenses, and loss of the ability to earn income for a period of time. Furthermore, they may lose the ability to perform work in the home or to enjoy their leisure activities. This study is primarily concerned with the loss of time, whether it be time in the labour force, time spent working in the home, or time spent enjoying leisure activity. Measures of wage loss are also calculated.

a. Wage Loss

When a worker who is in the labour force full-time suffers an injury, the calculation of the loss of wages is straightforward. The loss equals the number of weeks of disability multiplied by the weekly earnings. In this study the wage losses were measured net of income taxes. The measurement becomes more difficult for those who are in the labour force part of the year. For example, if someone normally works one quarter of the year and is injured for one week, has he lost a week of earnings? He may adjust the timing of his work in order to maintain his earnings. If he makes this adjustment, the effect of the disability is to reduce his leisure by one week rather than reduce his earnings. As a measure of the wage loss, the number of weeks of disability were multiplied by the individual's weekly earnings. This product was then multiplied by the weeks of work during the previous year divided by 52. This approach has the advantage that it accurately measures the wage loss for those who are disabled for a discrete number of years, but it may misrepresent the wage loss for those with short term disabilities.

Another measurement problem arises because current earnings and work patterns do not necessarily represent future earnings and work. Young people will have dramatically different earnings when they are older and most workers will eventually retire from the labour force. The only adjustment made in the wage loss measure was to assume that everyone retires at age 65 or 4 years after the accident, whichever comes later. The time loss mea-

sure, described below, incorporates some additional adjustments for younger victims.

b. Time Loss

The wage loss measure places no value on a disability for someone who is not in the labour force. The courts are now more willing to place a monetary value on the loss of ability to perform household duties. Extending this principle to all victims, a rough measure of time loss was calculated. The time loss was valued at \$140 per week, or \$7,280 per year. This is roughly what courts have provided for loss of household services.³⁴ The value of a week's time loss was assumed to equal the value of after-tax weekly earnings or \$140, whichever is greater. Those who are injured before age 21 are assumed to earn the average industrial wage (\$430.90 per week in 1986, \$327 after tax) after age 21. Everyone over age 65 is assumed to have a time loss valued at \$140 per week, the same as for all others who are not in the labour force. The \$140 minimum weekly loss is assumed to be net of tax. The wage loss and time loss measures are expressed as the present value of all future losses, discounted with a 2-1/2% real rate of discount.

2. Fatal

The losses arising out of a death can be viewed from the deceased victim's perspective or from the survivors' perspective. Three measures were calculated: wage loss, time loss and survivor loss. All three measures were calculated net of income tax. The wage loss and time loss calculations were made in the same way as for injured victims.

From a deterrence point of view, the at-fault driver should bear a cost at least equal to the present value of the time loss. The loss that the victim might have chosen to insure would be the survivors' losses. This principle is recognized in the Family Law Act, which extends tort claims to fatal accidents. The Act currently allows damages to be paid to survivors on the basis of the survivors' losses, not the deceased's.

The deceased may have been providing full or partial support for the other members of the family, but he was also consuming part of his income. In order to determine

the survivors' losses one must calculate the amount of income that the survivors must have in order to enjoy the same standard of living that they enjoyed before the accident. There have been a number of economic studies which attempt to estimate the amount of additional income required to maintain a constant standard of living as family size increases.³⁵ The methodologies of these studies include budget studies, opinion polls and analyses of expenditure patterns. The approach taken by Statistics Canada provides the most reasonable estimate.³⁶ By analyzing expenditure patterns of households of different composition, the Statistics Canada study found that a single individual needs 69% as much income as a couple in order to maintain the same standard of living. It is necessary to subtract 31% of family income from the lost earnings in order to estimate correctly the survivor's pecuniary loss. In other words the expected net income provided by the deceased for the benefit of the survivor in any future year is:

Deceased's Net Income

$$\begin{aligned}
 & - .31 \times [\text{Deceased's Net Income} + \text{Survivor's Net Income}] \\
 & = .69 \times \text{Deceased's Net Income} - .31 \times \text{Survivor's Net Income}
 \end{aligned}$$

A similar approach is used when there is more than one survivor. As family size increases, the proportion of family income that is required to maintain the standard of living of the survivors increases above .69.

The calculation of the survivors' losses was made using the time loss measure as the deceased's income. This, in effect, places a value on household services being provided by the victim.

C. Calculation of Compensation for Victims

1. Introduction

The sample of victims contains information on many characteristics of the individuals but does not contain any information on disability insurance coverage. Furthermore, the information on annual weeks worked and annual income refers to the individual's activity during the previous year. Since eligibility for many public and

private insurance programs depends on the recent employment history, it was necessary to make some assumptions concerning the timing of the accident. It was assumed that the accident occurs during the census reference week (in June) and that the 1980 information on income and weeks worked refer to the twelve month period just prior to the accident. This assumption should not have any important effect on the results.

Given the diversity of insurance coverage for injured victims as compared to those killed, these two groups were treated separately. The sample of fatalities contains 1,244 victims. The Ministry of Transportation and Communications reported 1,191 persons killed in motor vehicle accidents in 1985. The difference is due to the random process used to generate the data.

Most programs are indexed for inflation, with the exception of private long term disability benefits and accident benefits. Therefore, all calculations were done in real terms, and the value of nominally fixed benefits was assumed to fall at 5% per year. Discounting was done under the assumption of a 2.5% real discount rate. Future real wage growth due to productivity was not included.

2. Taxes

The tax treatment of compensation programs differs considerably. Therefore, the overall compensation was calculated net of taxes (including Canada Pension Plan contributions and Unemployment Insurance premiums). The 1986 tax system was assumed to be in place. Taxes were calculated given the earnings, pension, interest and other income of the individual. Taxes had to be calculated before the injury, after the injury but before compensation, and after compensation. In addition, the taxes had to be determined for those eligible for workers' compensation. It was assumed that all nominal amounts in the tax system are indexed for inflation. It was assumed that the recipient of tort damages could invest (in a home for example) or consume immediately without incurring tax liability.³⁷

3. Workers' Compensation

The Workers' Compensation Board provided data on the number of claims by occupation. The claim numbers were divided by the injured population in each occupation (excluding the self-employed) in order to obtain the probability that a victim would qualify for Workers' Compensation. The probabilities are shown in Table V-4. A random number was then generated in order to assign individuals to Workers' Compensation. Average weekly earnings during the previous year, after income tax, were the basis for the benefit calculation.

4. Canada Pension Plan

Canada Pension Plan disability benefits are payable only to those who are totally disabled. The benefits begin after a three month waiting period. Eligibility for the Canada Pension Plan disability insurance is based on the number of years of contributions prior to the disability. Given the absence of more than one year of work history it was necessary to assume that all workers over age 21 are eligible for CPP disability benefits. The pension calculation was also based on current earnings, not an average of previous earnings. Disabled Contributor's Child's benefits were assumed to be payable for all children for eight years after the accident because the exact ages of the children were not known.

5. Long Term Disability

Eligibility for long term disability insurance had to be assigned based on relatively little information. The initial group that might be eligible consisted of full-time workers between the ages of 19 and 64 who were employed at the time of the accident (the reference week), who worked more than 26 weeks during the previous year, whose self-employment income did not exceed their wages, and whose weekly wages were more than \$140. These requirements are arbitrary but are generally designed to capture the fact that those who are not full-time participants in the labour force and those just starting a job are not likely to be covered. The assignment by industry and occupation was loosely based on published compensation studies and collective agreement studies (Table II-2).³⁸ The resulting pattern of coverage by occupation is shown in Table V-5. The individual insurance coverage

TABLE V-4

Percentage Of Those Injured Covered By
Workers' Compensation By Occupation

<u>Occupation</u>	<u>Percentage</u>
Managerial, Administrative and Related	1.10
Natural Sciences, Engineering and Mathematics	2.05
Social Sciences and Related	2.68
Teaching and Related	1.20
Medicine and Health	2.43
Artistic, Literary, Recreational and Related	0.61
Clerical and Related	0.80
Sales	1.26
Service	6.99
Farming, Horticultural and Animal Husbandry	3.28
Other Primary	3.54
Processing	0.90
Machining and Product Fabricating, Assembling and Repairing	1.48
Constructions Trades	5.40
Transport Equipment Operating	60.49
Other	4.58

TABLE V-5

Percentage of Ontario Workers Assumed Covered For
Long Term Disability, Group and Individual By Occupation^a

<u>Occupation</u>	<u>Percentage</u>
Managerial, Administrative and Related	81
Natural Sciences, Engineering and Mathematics	73
Social Sciences and Related	30
Teaching and Related	96
Medicine and Health	11
Artistic, Literary, Recreational and Related	73
Clerical and Related	32
Sales	22
Service	24
Farming, Horticultural and Animal Husbandry	22
Other Primary	37
Processing	48
Machining and Product Fabricating, Assembling and Repairing	41
Constructions Trades	17
Transport Equipment Operating	23
Other	37

^a The percentages are based on full-time employees under age 65.

was assumed to be concentrated among those with more self-employment income than employment income.

For the purposes of the simulation the pattern of disability insurance coverage by industry and occupation does not have to match exactly the actual pattern. It is more important that the coverage mirror the actual distribution of coverage by income class and by eligibility for other benefits. There is no way of knowing whether the assumed pattern is realistic. The number of workers covered in the model (among the total population, not the injured population) is close to the number reported by the Canadian Life and Health Insurance Association.

The long term disability benefits were assumed to equal two thirds of weekly wages and to be taxable. It was assumed that the benefits are not indexed for inflation and that they decline in real terms by 5%.

In most cases subrogation rights are not exercised by those providing long term and short term disability benefits. Therefore, it was assumed that the recipient of disability insurance may receive compensation from tort damages as well. To the extent that some insurers or employers now exercise subrogation rights, the amount of compensation reported in the model will be too high.

6. Short Term Disability

The individuals covered by long term disability were assumed to be also covered for short term disability. The benefits were assumed to equal the wages for those in managerial, teaching and clerical occupations and for half of the workers in other occupations. For the remainder of those covered, the benefits were assumed to equal 70%.

7. Unemployment Insurance

Unemployment Insurance sickness benefits are payable to those with more than 20 weeks of employment during the previous year. The self-employed, those receiving short term disability benefits from employers, and those covered by workers' compensation are excluded from benefits.

8. Accident Benefits

The model was able to replicate closely the Accident Benefits income replacement provisions. Those between the ages of 18 and 64, who worked more than 26 weeks in the previous year or who were employed at the time of the accident, and who were not covered by workers' compensation were eligible for loss of income benefits under Section B, subject to the amount of benefits received from employers and private disability insurance. Those not qualifying for these benefits may qualify as 'principal unpaid housekeepers'. The Accident Benefits for disabilities lasting more than one year are assumed to be constant in nominal terms and to fall in real terms by 5% per year.

9. Tort Damages

a. Liability

The reports filed at the scene of the accident contain information on the conduct of the driver, cyclists, or pedestrian. These data can be used to assign fault in the model. Drivers who were not driving properly were assumed to be at fault. Cyclists and pedestrians who were not riding or walking properly were also assumed to be at fault. Passengers were assumed to be not at fault. These assumptions produce the pattern of liability shown in Table V-6.

Unfortunately, the action of the other driver in a collision with another motor vehicle was not known.³⁹ However, it appears that 60.87% of the drivers hitting other motor vehicles were found to be driving properly. There are two interpretations of this. First, multi-vehicle collisions could be initiated by one driver driving improperly. Second, two-car collisions could be truly accidents, with neither driver found to be driving improperly by the officer at the scene. This second interpretation was assumed for the purposes of assigning liability. Under this second interpretation it is possible that a court might assign liability to one or the other driver or might divide fault between the two. The risk of losing on the liability question when both drivers were driving properly (as observed at the scene of the accident) would induce most drivers to settle for less than the full loss. In the model it is assumed that $((60.87 - 39.13)/60.87)$

TABLE V-6Number of Injured Victims By Category and Fault

<u>Category of Person</u>	<u>At Fault</u>	<u>Not At Fault</u>	<u>Total</u>
Driver of Passenger Vehicle or Motorcycle	17,908	13,323	31,231
Driver of Other Motor Vehicle	1,178	630	1,808
Passenger	0	20,597	20,597
Pedestrian or Cyclist	4,221	2,780	7,001
<hr/>			
TOTAL	23,307	37,330	60,637
<hr/>			

*100 = 35.7% of drivers who were driving properly and who hit other motor vehicles would recover one half of their losses. This would occur as a result of an explicit court decision, or more likely, as a result of settlement for less than the full loss.

b. Tort Damages

The principle behind tort damages is straightforward: the victim should be restored to the level of well-being he/she had prior to the accident. This principle is not easily implemented when there are non-pecuniary losses, as will almost always be the case when there are injuries. The Supreme Court of Canada limited damages for non-pecuniary loss to \$100,000 in January 1978, indexed for inflation. The limit is now nearly \$200,000.

Compensation for loss of wages is straightforward for those who were full-time members of the labour force prior to the accident. The damages will equal wages lost prior to settlement or trial plus the present value of future wages and pensions. It becomes more difficult to calculate damages when someone is not currently in the labour force, but courts will attempt to assess the likelihood that wages would have been earned, had the accident not taken place. Increasingly, courts have been willing to place a value on non-market activities. In the model two alternative assumptions were made concerning tort damages. The first assumption was that the award would be based on the value of lost time, as described above.

A second assumption concerning tort awards is based on the bodily injury insurance claim data collected by Joe Cheng at Eckler Partners. Those completing the claim reports were asked to report the weekly wages and the amount of lost time: from these data third party claimants who were not at fault and were employed were selected. The present value of lost wages as of the date of the accident was compared to the present value of compensation for lost employment income plus non-pecuniary damages. These amounts are net of Section B accident benefits. The average compensation for lost employment, evaluated at the date of the accident was \$6,106, compared with the present value of lost wages equal to \$9,664. On the other hand, non-pecuniary damages averaged \$5,664. Average total damages equalled \$11,770, 22% more than the lost wages.

Most previous studies of tort compensation have suggested that the ratio of compensation to loss falls with the magnitude of the loss. The relationship between the present value of wage loss and the present value of compensation was estimated with least squares regression on the Eckler data. Specifically, the compensation for lost employment income plus non-pecuniary loss was regressed on wage loss plus dummy variables for low loss individuals (Table V-7). The coefficients were statistically significant. The hypothesis that the compensation increases one for one with the wage loss could be rejected. Each dollar of wage loss adds \$0.467 of tort compensation. The estimated equation was used in the simulation as an alternative predictor of tort damages. In the prediction the value of lost time was substituted for the value of lost wages. For example, predicted tort damages are \$20,236 plus 46.7% of the value of lost time for those with a loss in excess of \$10,000. Those with losses below \$1,000 are predicted to have tort damages equal to \$2,181 plus 46.7% of the value of the time loss.

10. Welfare

Permanently disabled individuals between the ages of 18 and 64 who did not receive tort benefits and whose family income was less than \$8,769 (\$6,000 in 1980) was assumed to be potentially eligible for GAINS-D benefits, subject to annual income tests. The benefits, which in practice vary with special needs, were assumed to equal \$151 per week minus the benefits received from other sources. The estimate of those who would receive welfare payments does not include injured children who might eventually receive welfare, unless the family income was initially below \$8,769.

D. Sources of Compensation for Survivors

1. Workers' Compensation

Coverage of those killed under workers' compensation was calculated in the same way as for those injured. Given the lack of information on the exact age of children, the benefits were assumed to be payable to all children for twelve years.

TABLE V-7Regression Of Tort Compensation On Time LossEckler Partners Data

Dependent

Variable : Compensation for Wage Loss plus Non-Pecuniary^aAnalysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	4	235721011838	58930252959	217.027	0.0001
Error	505	137125008023	271534669.35		
C Total	509	372846019861			
Root MSE		16478.30906	R-Squared	0.6322	
Dep Mean		11770.22549	Adj R-Sq	0.6293	
C.V.		139.99994			

Parameter Estimates

Variable	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob> T
INTERCEP	20236	1985.2	10.193	0.0001
PVLOSS	.46737	.02039	22.917	0.0001
Loss < 1000	-18055	2391.7	-7.549	0.0001
1000 ≤ L < 5000	-14876	2277.9	-6.530	0.0001
5000 ≤ L < 10000	-12683	2763.9	-4.589	0.0001

^a The tort damages are expressed as the present value at the date of the accident.

2. Canada Pension Plan

The amount of benefits payable had to be calculated with the current earnings of the deceased, rather than with the longer-term measure that is actually used. Given the lack of detailed information on the exact age of children, the benefits were assumed to be payable to all children for nine years.

3. Group Life Insurance

Eligibility for group life insurance was assumed to be the same as for long term disability. The amount of the coverage was set at twice the deceased's annual wages.

4. Group Death Benefits

Sixty per cent of those covered by group life were assumed to be covered by Accidental Death and Dismemberment benefits equal to twice annual earnings.

5. Survivors' Income

Fifteen per cent of those covered by group life were assumed to be covered for survivors' income benefits equal to 25% of the deceased's earnings.

6. Accident Benefits (Schedule B)

The provisions were accurately captured in the model.

7. Tort

Tort damages were payable for those with survivors in the household when the deceased was not at fault. Table V-8 shows the pattern of fault by category of person killed. Forty-four per cent of the victims were not at fault or were only partially at fault. The tort damages were assumed to equal the present value of the survivors' loss, calculated as described above plus \$25,000 per family member. No damages were assumed to be payable for the death of a child. The tax gross-up on the award was calculated in a rough way based on a typical set of assumptions.

TABLE V-8Deceased Victims By Category and Fault

<u>Category of Person</u>	<u>At Fault</u>	<u>Not At Fault</u>	<u>Total</u>
Driver of Passenger Vehicle or Motorcycle	498	100	598
Driver of Other Motor Vehicle	31	1	32
Passenger	0	375	375
Pedestrian or Cyclist	172	67	239
<hr/>			
TOTAL	701	543	1,244
<hr/>			

8. Welfare

The survivors who did not receive tort benefits were assumed to receive benefits equal to the difference between their income and \$151 per week. This is only a rough approximation of existing welfare programs.

E. Limitations of the Model

A model of this type naturally relies on many assumptions, some of which have important effects on the results. The modelling of the government programs should produce reasonably accurate estimates. The model does assume, however, that every victim pursues all of the benefits to which he is entitled (and not more). The assumptions concerning private sector coverage are based on incomplete information, but the magnitude of possible error is relatively small. The greatest source of potential error lies in the modelling of tort damages. It is likely that there is a much greater variance in the amount of actual tort compensation for a given loss than is captured in the model. This variance arises because of differences in the victim's aggressiveness in pursuing a tort action, the quality of the evidence, the ability of lawyers and other factors. Furthermore, tort compensation is available for partial disabilities, which are not recognized in the model.

The measurement of the adequacy of compensation depends on estimates of the loss as well as estimates of compensation. The duration of disability is only approximate, but errors in duration affect the aggregate estimates, not the individual estimates of the compensation to loss ratio for a given duration. The use of census data for individuals allows one to make reasonable estimates of the size of the after-tax wage loss, but the time-loss measure is based on an arbitrary value of time for those not in the labour force.

VI. PATTERNS OF COMPENSATION

A. Injuries

The simulation of the compensation for victims generates the present value of the losses and the compensation at the date of the accident. Table VI-1 summarizes the aggregate losses and compensation as predicted by the

TABLE VI-1Sources of Compensation For Injured

Tort Damages	\$ 375,358,000	
Accident Benefits	90,324,000	
Long Term Disability	60,425,000	
Short Term Disability and Sick Leave	48,249,000	
Canada Pension Plan	46,309,000	
Unemployment Insurance	21,183,000	
Workers' Compensation	16,921,000	
Welfare (GAINS-D)	3,807,000	
Total Compensation	662,476,000	
- Taxes on Benefits	- <u>34,744,800</u>	
Compensation After Tax	627,732,000	
Compensation/Wage Loss		2.02
Wage Loss After Tax	310,943,000	
Compensation/Time Loss		0.98
Time Loss After Tax	639,880,000	

tion estimated with the Eckler claims data.⁴⁰ The total after-tax loss of wages was \$310 million and the value of lost time was \$639 million. The after-tax compensation was \$627 million, nearly equal to the value of the lost time. This surprising result supports the view that the total compensation paid in the current system is adequate but that it needs to be redistributed so as to more closely match each individual's loss.⁴¹ A total of \$203 million, a third of the total compensation, is paid to individuals in excess of the value of their time loss, and the rest of the victims receive in aggregate \$215 million less than their time loss.

Tort damages are the largest source of benefits, contributing 57% of total gross benefits (Figure VI-1). The benefits are particularly important for those who are not full-time members of the labour force. With the exception of twelve weeks of benefits payable to a homemaker under the Accident Benefits coverage, tort compensation is the only source of compensation for those not in the labour force. It is interesting to note that the sum of Accident Benefits, employer insurance, the Canada Pension Plan, Unemployment Insurance, Workers' Compensation and taxes (subtracted) is 80% of aggregate after-tax wage loss. This aggregate relationship reminds one that a major role for tort damages, aside from deterrence, is to compensate time loss. That is, tort damages provide compensation for those who have lost the ability to enjoy their ordinary activities, whether or not they are in the labour force, as long as the victim was not at fault. In the process the damages over-compensate those who are already insured for wage loss.

The current principles of tort damages do not permit the deduction of collateral benefits from the damages otherwise payable, with the exception of Accident Benefits. Consequently, the total compensation can exceed the total loss. If tort damages for lost earnings plus non-pecuniary loss were limited to the after-tax value of lost time, tort damages would fall from \$375 million to \$231 million, a decrease of \$144 million. In order to implement such a change in the method of damage assessment the present value of future benefits from all sources would have to be calculated.

SOURCES OF COMPENSATION FOR INJURED

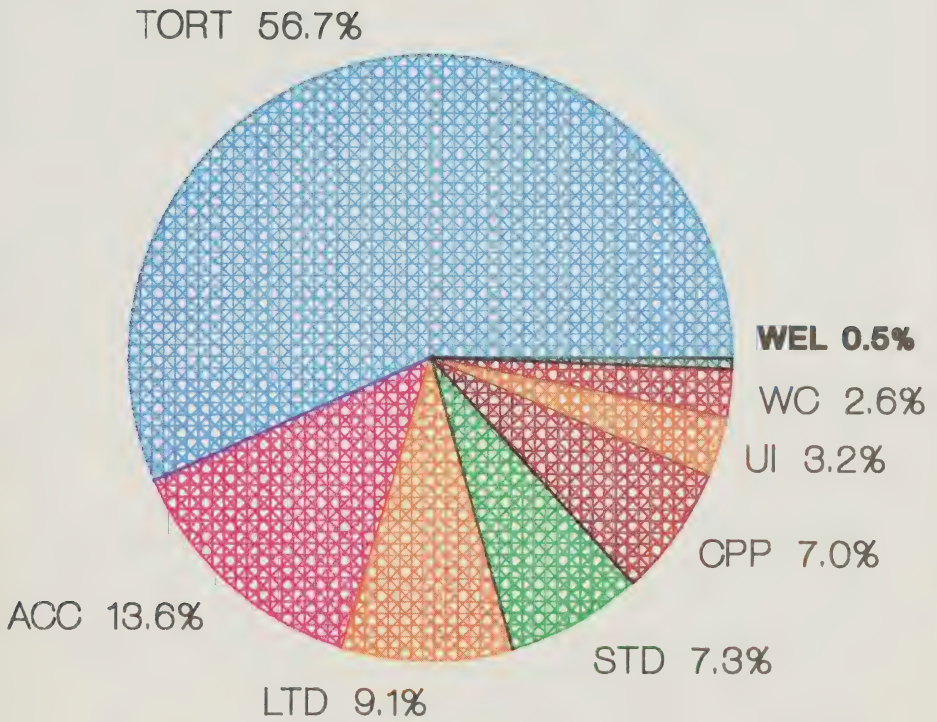


Table VI-2 presents the number of victims who are covered by alternative programs. Many of those covered by a particular program may not receive benefits from that program because their duration of disability may not be sufficient or their other benefits may be sufficiently high that no benefits are payable. About 60% of the victims are eligible for tort damages and 73% of victims are covered by Accident Benefits. The percentages change if one looks at the subset of victims who have wage loss. Eighty-seven per cent of those with wage loss are covered by Accident Benefits. The model predicts that 30% of those with wage loss are covered by private (group or individual) long term disability insurance. When Workers' Compensation is added to this, 34.4% of those with wage loss are reasonably well insured for long term disability. An even larger percentage are insured for short term disability. Either Unemployment Insurance or employer short term disability insurance (or sick leave) covers 83.6% of those with wage loss.⁴²

The number of persons actually receiving benefits is lower than the amount covered (Table VI-3). For example, employer benefits reduce the number who can receive accident benefits and Canada Pension Plan benefits are only payable for those who are permanently disabled.

Table VI-4 indicates the number of people who receive benefits from one source who also receive benefits from other sources.

The pattern of replacement of lost wages varies significantly with the length of disability. As duration increases, the ratio of compensation to wage loss and compensation to time loss falls dramatically (Table VI-5). One reason for this is that short term income replacement tends to be more complete than long term disability insurance. Another reason is that unemployment insurance provides short term coverage for those without extensive employer benefits. A more important explanation lies in the pattern of tort compensation that was imputed. Those with as little as one week of lost time will receive an estimated \$2,181 plus 46.7% of their lost earnings. This amount is free of income tax while the lost wages were taxed. As a result, the average ratio of compensation to wage loss is a surprising 19.0 for those with only one week of disability. This ratio falls to about 2.0 for those with long term disability. The average person with a permanent disability receives twice his/her actual wage loss when all the programs are taken into account.

TABLE VI-2Number and Percent of Injured Covered By Source

	Victims With Time Loss		Victims With Wage Loss	
	Number	% of Victims	Number	% of Victims
Tort Damages	36,326	59.9	23,655	55.6
Accident Benefits	38,167	62.9	35,983	87.4
Long Term Disability	12,377	20.4	12,377	30.1
Short Term Disability	11,792	19.4	11,792	28.7
Canada Pension Plan	38,294	63.2	39,365	95.7
Unemployment Insurance	22,601	37.3	22,601	54.9
Workers' Compensation	1,757	2.9	1,757	4.3
Welfare (GAINS-D)	70	0.1	57	.1
TOTAL	60,637	100.0	41,147	100.0

TABLE VI-3Number and Percent of Injured Receiving Benefits By Source

	Victims With Time Loss		Victims With Wage Loss	
	Number	% of Victims	Number	% of Victims
Tort Damages	35,550	58.6	22,879	55.6
Accident Benefits	28,139	46.4	28,139	68.4
Long Term Disability	1,568	2.6	1,568	3.8
Short Term Disability	11,750	19.4	11,750	28.6
Canada Pension Plan	624	1.0	624	1.5
Unemployment Insurance	12,999	21.4	12,999	34.0
Workers' Compensation	1,757	2.9	1,757	4.3
Welfare (GAINS-D)	70	0.1	57	.1
TOTAL	60,637	100.0	41,147	100.0

TABLE VI-4

INJURED VICTIM RECEIPT OF BENEFITS FROM MORE THAN ONE PROGRAM

	WC	CPP	STD	LTD	UI	ABen	Tort	Wel
Workers' Compensation (WC)	1757	33	265	37	0	0	0	8
Canada Pension Plan (CPP)	33	624	196	214	338	563	361	50
Short Term Disability (STD)	265	196	11750	1494	0	3641	7032	13
Long Term Disability (LTD)	37	214	1494	1568	352	4226	7372	14
Unemployment Insurance (UI)	0	338	0	352	12999	12559	7474	28
Accident Benefits (ABen)	0	563	3641	4226	12559	28139	15939	44
Tort	0	361	7032	7372	7474	15939	35550	0
Welfare (Wel)	8	50	13	14	28	44	0	70

TABLE VI-5Compensation Ratio By Duration Of DisabilityTort Damages Estimated From Eckler Data

Duration of Disability (Weeks)	<u>Compensation</u>	<u>Compensation</u>
	Wage Loss	Time Loss
1	19.00	7.68
2	7.35	4.40
3-4	6.30	3.37
5-13	6.59	2.55
14-26	3.37	1.98
27-52	2.28	1.57
53-207	1.94	1.21
Permanent	2.03	0.66
ALL	9.80	4.24

Another reason why the replacement ratio for wages is high is that disability programs such as Accident Benefits, Unemployment Insurance and the Canada Pension Plan do not differentiate between part-year and full-year workers. Once eligibility is established, the victim can collect for each week in the year, even if he had worked only part-year in the past.⁴³ The wage loss figures are reduced by the fraction of the year not worked, thereby adding to the ratio.

The ratio of compensation to time loss is a more meaningful measure of the losses (although one could argue about the value placed on lost time). The ratio of compensation to the value of time loss falls from 7.68 for those with one week of lost time to .66 for those with permanent disability. The latter figure is in line with the ratio provided in employer long term disability plans (but these are not necessarily indexed for inflation).

The pattern of compensation by duration of disability is particularly sensitive to the assumption made about tort compensation. If one assumes that tort damages equal the value of time loss minus accident benefits,⁴⁴ the replacement ratio does not fall so dramatically with duration of disability (Table VI-6).

The average replacement ratio conceals a wide variation in the percentage replacement. Tables VI-7 and VI-8 provide the distribution of replacement ratios. Only 10% of victims receive no compensation; 47% receive more than three times their time loss. This number is affected by the large number of victims with one or two weeks of lost time and several thousand dollars in damages for non-pecuniary loss. If one looks at the distribution for those with permanent disability, about 9% receive no compensation and no one receives more than double his or her time loss.

Tables VI-9 and VI-10 present some information on those with less than 25% compensation for lost time. This group of victims was at fault and was therefore not eligible for tort damages. The bulk of the victims who are under-compensated are out of the labour force and are therefore likely to be ineligible for most of the insurance benefits. Of these, 56% are under age twenty, and the majority of these are male. Therefore, if one wanted to stereotype the uncompensated victim, he is a male teenager with little employment history who was driving negligently.

TABLE VI-6Compensation Ratio By Duration Of DisabilityTort Damages Equal Value Of Time LossMinus Accident Benefits

Duration of Disability (Weeks)	<u>Compensation</u>	<u>Compensation</u>
	Wage Loss	Time Loss
1	2.05	1.09
2	1.44	1.02
3-4	1.62	1.08
5-13	2.12	1.13
14-26	1.66	1.12
27-52	1.33	1.02
53-207	1.39	0.94
Permanent	2.80	0.88
ALL	1.88	1.08

TABLE VI-7
DURATION OF DISABILITY

Compensation/Wage Loss	1 Week		2 Weeks		3-4 Weeks		5-13 Weeks	
	N	PCTN	N	PCTN	N	PCTN	N	PCTN
No wage loss	6,203	30.88	1,335	34.00	2,281	33.36	4,986	
No Compensation	429	2.14	91	2.32	133	1.95	274	
25% or less	20	0.10	4	0.10	4	0.06	4	
26-50%	411	2.05	90	2.29	40	0.58	48	
51-75%	703	3.50	156	3.97	160	2.34	175	
75-99%	561	2.79	113	2.88	282	4.12	613	
100%	68	0.34	13	0.33	25	0.37	50	
101-125%	1,268	6.31	278	7.08	539	7.88	1,460	
126-150%	774	3.85	147	3.74	312	4.56	801	
151-200%	508	2.53	128	3.26	224	3.28	574	
201-300%	324	1.61	97	2.47	181	2.65	790	
300% and over	8,819	43.90	1,475	37.56	2,657	38.86	5,717	
ALL	20,088	100.00	3,927	100.00	6,838	100.00	15,492	

CONTINUED

Table VI-7

DURATION OF DISABILITY

Compensation/Wage Loss	5-13 Weeks		14-26 Weeks		27-52 Weeks		53-207 Weeks	
	PCTN	N	PCTN	N	PCTN	N	PCTN	N
No Wage Loss	32.18	2,154	33.31	1,341	32.49	790	31.60	
No Compensation	1.77	109	1.69	74	1.79	49	1.96	
25% or Less	0.03	3	0.05	2	0.05	24	0.96	
26-50%	0.31	24	0.37	35	0.85	106	4.24	
51-75%	1.13	63	0.97	127	3.08	123	4.92	
75-99%	3.96	212	3.28	262	6.35	164	6.56	
100%	0.32	10	0.15	1	0.02	1	0.04	
101-125%	9.42	780	12.06	441	10.69	222	8.88	
126-150%	5.17	254	3.93	131	3.17	103	4.12	
151-200%	3.71	188	2.91	150	3.63	193	7.72	
201-300%	5.10	436	6.74	436	10.56	346	13.84	
300% and over	36.90	2,234	34.54	1,127	27.31	379	15.16	
ALL	100.00	6,467	100.00	4,127	100.00	2,500	100.00	

CONTINUED

Table VI-7

DURATION OF DISABILITY

Compensation/Wage Loss	Permanent			All		
	N	PCTN	N	PCTN	N	PCTN
No Wage Loss	400	33.39	19,490			32.14
No Compensation	-	-	1,159			1.91
25% or Less	18	1.50	79			0.13
26-50%	53	4.42	807			1.33
51-75%	102	8.51	1,609			2.65
75-99%	71	5.93	2,278			3.76
100%	1	0.08	169			0.28
101-125%	117	9.77	5,105			8.42
126-150%	108	9.02	2,630			4.34
151-200%	108	9.02	2,073			3.42
201-300%	76	6.34	2,686			4.43
300% and Over	144	12.02	22,552			37.19
ALL	1,198	100.00	60,637			100.00

TABLE VI-8

DURATION OF DISABILITY

Compensation/Time Loss	1 Week		2 Weeks		3-4 Weeks		5-13 Weeks	
	N	PCTN	N	PCTN	N	PCTN	N	PCTN
No Compensation	1,829	9.10	447	11.38	767	11.22	1,645	11.22
25% or Less	189	0.94	42	1.07	91	1.33	138	1.33
26-50%	1,469	7.31	309	7.87	389	5.69	813	5.69
51-75%	1,088	5.42	246	6.26	312	4.56	582	4.56
75-99%	857	4.27	192	4.89	465	6.80	1,234	6.80
100%	95	0.47	18	0.46	24	0.35	48	0.35
101-125%	1,169	5.82	262	6.67	527	7.71	1,401	7.71
126-150%	596	2.97	113	2.88	226	3.31	625	3.31
151-200%	78	0.39	23	0.59	45	0.66	270	0.66
201-300%	93	0.46	40	1.02	228	3.33	1,086	3.33
300% and over	12,625	62.85	2,235	56.91	3,764	55.05	7,650	55.05
ALL	20,088	100.00	3,927	100.00	6,838	100.00	15,492	100.00

CONTINUED

Table VI-8

Compensation/Time Loss	DURATION OF DISABILITY					
	5-13 Weeks		14-26 Weeks		27-52 Weeks	
	PCTN	N	PCTN	N	PCTN	N
No Compensation	10.62	691	10.69	453	10.98	230
25% or Less	0.89	68	1.05	182	4.41	184
26-50%	5.25	393	6.08	138	3.34	193
51-75%	3.76	215	3.32	259	6.28	204
75-99%	7.97	480	7.42	406	9.84	233
100%	0.31	10	0.15	-	-	-
101-125%	9.04	770	11.91	416	10.08	240
126-150%	4.03	139	2.15	79	1.91	346
151-200%	1.74	241	3.73	895	21.69	389
201-300%	7.01	1,543	23.86	813	19.70	434
300% and Over	49.38	1,917	29.64	486	11.78	47
ALL	100.00	6,467	100.00	4,127	100.00	2,500

CONTINUED

Table VI-8

DURATION OF DISABILITY

Compensation/Time Loss	Permanent				All
	N	PCTN	N	PCTN	
No Compensation	106	8.85	6,168	10.17	10.17
25% or Less	107	8.93	1,001	1.65	1.65
26-50%	123	10.27	3,827	6.31	6.31
51-75%	413	34.47	3,319	5.47	5.47
75-99%	191	15.94	4,058	6.69	6.69
100%	-	-	195	0.32	0.32
101-125%	162	13.52	4,947	8.16	8.16
126-150%	88	7.35	2,212	3.65	3.65
151-200%	8	0.67	1,949	3.21	3.21
201-300%	-	-	4,237	6.99	6.99
300% and over	-	-	28,724	47.37	47.37
ALL	1,198	100.00	60,637	100.00	100.00

TABLE VI-9

Number of Injured Victims With Less Than 25% Compensation For Time Loss

Age	Labour Force Status	Driver of Private Passenger Vehicle	Driver of Other Motor Vehicle	Passenger	Pedestrian or Cyclist	ALL
0-15	Employed	-	-	-	11	11
	Unemployed	-	1	-	2	3
	Not In Labour Force	71	32	-	1,814	1,917
16-19	Employed	367	14	8	59	448
	Unemployed	141	3	2	33	179
	Not In Labour Force	1,236	49	3	216	1,504
20-24	Employed	260	10	1	32	303
	Unemployed	219	9	-	24	252
	Not In Labour Force	328	11	-	26	365
25-34	Employed	140	9	-	21	170
	Unemployed	67	9	1	13	90
	Not In Labour Force	191	12	-	28	231
35-64	Employed	152	16	-	19	187
	Unemployed	57	1	-	3	61
	Not In Labour Force	296	9	-	47	352
65+	Employed	12	-	-	3	15
	Unemployed	3	-	-	1	4
	Not In Labour Force	857	19	-	264	1,140
ALL		4,397	204	15	2,616	7,232

TABLE VI-10

Number Of Injured Victims With Less Than 25% Compensation
For Time Loss By Sex, Age and Labour Force Status

Female

Age	<u>Labour Force Status</u>			All
	Employed	Unemployed	Not In Labour Force	
0-15	4	-	586	590
16-19	128	43	390	561
20-24	57	62	105	224
25-34	42	33	147	222
35-64	44	28	231	303
65+	7	3	499	509
ALL	282	169	1,958	2,409

Male

Age	<u>Labour Force Status</u>			All
	Employed	Unemployed	Not In Labour Force	
0-15	7	3	1,331	1,341
16-19	320	136	1,114	1,570
20-24	246	190	260	696
25-34	128	57	84	269
35-64	143	33	121	297
65+	8	1	641	650
ALL	852	420	3,551	4,823

B. Fatalities

The aggregate compensation payable to survivors or the estates of those killed in motor vehicle accidents is shown in Figure VI-2 and Table VI-11. Given that the current basis for tort compensation is compensation of survivors, not replacement of lost earnings, tort compensation tends to be a smaller percentage of total wage loss or time loss. Furthermore, it is easier to provide private coverage for survivors' losses than it is to provide disability insurance because the latter has more moral hazard. Consequently, the private insurance arrangements, primarily different types of life insurance, provide a higher percentage of the total compensation. It is interesting to note that the total after-tax compensation exceeds the aggregate survivor losses but falls well short of equalling the value of the lost time of the deceased. It should be noted that for efficient deterrence, tort damages for wrongful death should be much higher and should at least equal the victim's time loss.

Table VI-12 measures the number of victims whose survivors or estates receive benefits from alternative sources. The modest amount of accident benefits provides compensation in all cases not covered by workers' compensation.⁴⁵ The Canada Pension Plan is predicted to provide benefits to 75% of those with survivors. The relatively low percentage of victims with survivors who receive tort benefits is due, in part, to the higher percentage of drivers who are at fault in fatal accidents. Thirty-four percent of the fatal accidents involve impact with a fixed object or other circumstances (rollover for example) compared with 23% of the accidents with injuries.⁴⁶ These types of accidents can be assumed to be the fault of the driver. Table VI-13 shows the two-way classification of receipt benefits from alternative programs.

SOURCES OF COMPENSATION FOR SURVIVORS

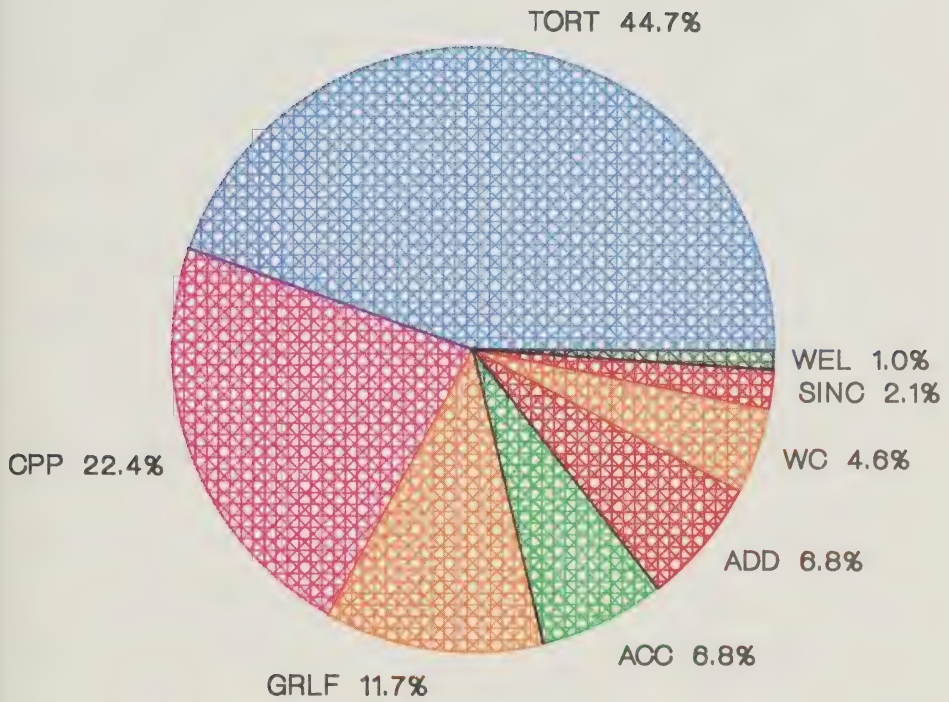


TABLE VI-11Sources of Compensation For Survivors or Estates

Tort Damages	\$ 54,593,000	
Canada Pension Plan	27,386,000	
Group Life	14,330,000	
Accident Benefits	8,260,000	
Accidental Death and Dismemberment	8,264,000	
Worker's Compensation	5,571,000	
Survivor Income	2,574,000	
Welfare	<u>1,265,000</u>	
Total Compensation Before Tax	122,248,000	
Taxes	- 5,359,000	
	<u></u>	
Total Compensation After Tax	116,889,000	
Total Survivor Loss	102,580,000	
Compensation/Survivor Loss		1.14
Total Wage Loss	212,789,000	
Compensation/Wage Loss		.55
Total Time Loss	412,712,000	
Compensation/Time Loss		.28

TABLE VI-12

Number and Percent of Deceased Victims Receiving Benefits By Source

	All Victims		Victims With Wage Loss		Victims With Survivors	
	Number	% of Victims	Number	% of Victims	Number	% of Victims
Tort Damages	265	21.3	176	22.7	223	39.9
Accident Benefits	1,205	96.9	739	95.1	536	95.9
Group Life	254	20.4	247	31.8	180	32.2
Accidental Death and Dismemberment	143	11.5	140	18.0	98	17.5
Survivor Income	35	2.8	35	4.5	28	5.0
Canada Pension Plan	621	49.9	621	79.9	420	75.1
Workers' Compensation	39	3.1	38	4.9	23	4.1
Welfare	18	1.4	7	0.9	13	2.3
Total	1,244	100.0	777	100.0	559	100.0

TABLE VI-13

Receipt Of Benefits From More Than One Program By Survivors and Estate

	WC	CPP	GRLF	ADD	SI	ABen	Tort	Wel
Workers' Compensation (WC)	39	30	11	9	2	0	0	0
Canada Pension Plan (CPP)	30	621	236	134	32	591	165	5
Group Life (GRLF)	11	236	254	143	35	243	70	0
Accidental Death and Dismemberment (ADD)	9	134	143	143	18	134	40	0
Spouse Insurance (SI)	2	32	35	18	35	33	10	0
Accident Benefits (ABen)	0	591	243	134	33	1205	265	18
Tort	0	165	70	40	10	265	265	0
Welfare (Wel)	0	5	0	0	0	18	0	18

Table VI-14 provides the distribution of compensation-loss ratios for three alternative measures of loss: wage loss, time loss and survivor loss. Since the survivor loss is the smallest of the three, the compensation to loss ratio is highest for this measure. In fact, the aggregate compensation exceeds the aggregate survivor loss by 12% (Table VI-11). The compensation is a much smaller percentage of the value of time loss, which is not surprising given that the rationale for the Family Law Act provisions for wrongful death are intended to compensate survivors, not deter accidents. Fifty-five percent of the deaths do not give rise to survivor loss (as measured here). Only 11% of the deaths result in compensation of survivor loss below 50%, but these cases represent about one quarter of the total deaths with survivors.

Tables VI-15 and VI-16 provide the age, sex, labour force status, and category of person for those whose survivors received less than 25% of their losses. The women tend to be out of the labour force. Unlike the under-compensated injured male victims, the men in this group tend to be employed because those with a family are more likely to be in the labour force than those without families. Compensation for survivors tends to be low when the victim was at fault and other forms of survivor benefits are not payable.

DISTRIBUTION OF COMPENSATION-LOSS RATIO

ESTATES OR SURVIVORS

Compensation/Loss	Wage Loss		Time Loss		Survivor Loss	
	Number	%	Number	%	Number	%
No Loss	467	37.5	0	0.0	685	55.1
25% or Less	389	31.3	809	65.0	55	4.4
26-50%	122	9.8	178	14.3	86	6.9
51-75%	56	4.5	83	6.7	68	5.5
75-99%	39	3.1	68	5.5	35	2.8
100%	0	0.0	0	0.0	0	0.0
101-125%	42	3.4	48	3.9	24	1.9
126-150%	26	2.1	37	3.0	38	3.1
151-200%	41	3.3	21	1.7	89	7.2
201-300%	34	2.7	0	0.0	91	7.3
300% and Over	28	2.3	0	0.0	73	5.9
ALL	1,244	100.0	1,244	100.0	1,244	100.0

TABLE VI-15

Number Of Survivors With Less Than 25% Compensation By
Age, Sex and Labour Force Status Of Deceased

Female Deceased

Age of Deceased	Labour Force Status of Deceased			All
	Employed	Unemployed	Not In Labour Force	
16-19	-	-	1	1
20-24	2	1	1	4
25-34	1	-	2	3
35-64	-	-	7	7
All	3	1	11	15

Male Deceased

Age of Deceased	Labour Force Status of Deceased			All
	Employed	Unemployed	Not In Labour Force	
16-19	-	1	-	1
20-24	17	1	-	18
25-34	19	-	-	19
35-64	12	-	2	14
65+	1	-	-	1
ALL	49	2	2	53

TABLE VI-16

Number Of Survivors With Less Than 25% Compensation
By Age, Labour Force Status and Category of Deceased

Deceased Category of Deceased

Age	Labour Force Status	Category of Deceased			ALL
		Driver of Private Passenger Vehicle	Driver of Other Motor Vehicle	Pedestrian or Cyclist	
16-19	Unemployed	1	-	-	1
	Not In Labour Force	1	-	-	1
20-24	Employed	15	1	3	19
	Unemployed	2	-	-	2
	Not In Labour Force	1	-	-	1
25-34	Employed	16	2	2	20
	Not In Labour Force	1	-	1	2
35-64	Employed	10	2	-	12
	Not In Labour Force	9	-	-	9
65+	Employed	1	-	-	1
ALL		57	5	6	68

VII. ALTERNATIVE PROGRAMS FOR PERSONAL INJURY COMPENSATION

A. No-Fault Motor Vehicle Insurance

The model is well-suited to forecasting the cost of any alternative compensation system. However, there is no behavioural response built into the model. That is, a generous compensation system would increase the number of lost time injuries and increase the duration of disability. Given that the duration of disability data are based, in part, on the experience in Quebec, such a response may already be included in the model, but any significant extension of benefits beyond those provided in Quebec could lead to higher costs. It should also be noted that administrative costs are not included in the estimates. One of the claimed advantages of switching from a fault system to a no-fault system is a reduction in administrative costs.

Consider first a program that would eliminate tort compensation (and accident benefits) entirely and would offer primary coverage to all victims of automobile accidents. The benefits would be 90% of after-tax earnings up to a maximum benefit of \$30,000 per year. The minimum benefit would be \$140 per week (\$7,280 per year) for all victims. For those injured prior to age 65, the benefits would be set at \$7,280 at age 65. For those injured after 65, benefits would equal 90% of lost earnings (up to the maximum) for life. This program would cost \$519 million or \$99 per vehicle.⁴⁷ Against this cost one could deduct \$90 million in Accident Benefits and \$375 million in tort benefits, for a net additional cost of \$54 million or \$10 per vehicle. There would be substantial savings in other programs (which would provide secondary coverage) to the extent that they would be integrated with the no-fault automobile insurance. These savings would not show up in reduced motor vehicle insurance premiums.

B. Threshold No-Fault

An alternative no-fault system would eliminate tort claims for those falling below some threshold of loss. The threshold might be those with continuing losses, evaluated at the end of the fourth year after the accident. That is, anyone not permanently disabled would collect from the no-fault system and would not be able to

file a tort claim. Those permanently disabled would sue for the future losses only, evaluated at the end of the fourth year after the accident. For the first four years the permanently disabled victim would collect from the no-fault benefit program, described in the previous section.

This proposed system would reduce tort claims from 35,550 per year to 770. It would universally compensate victims for a limited period of time. At the end of this period, those claiming permanent losses and who were not at fault would have to demonstrate permanent disability in an adversarial process. The advantage of using tort damages for permanent losses is that tort damages are able to take into account losses that are difficult to deal with in a rigid no-fault insurance system. For example, tort damages can better approximate the losses associated with long term partial disability. Furthermore, the tort system has the flexibility to provide appropriate permanent compensation for those who are not in the labour force at the time of the accident, yet would have significant long term income loss. For example, the earnings of a young person at the time of an accident are not representative of long term earnings. Similarly, homemakers might reduce their labour force participation while their children are young. Those not in the labour force are not always treated fairly under no-fault systems because they must have a set of rigid rules for dealing with such cases. The use of lump sum tort damages for long term disability also has the advantage of eliminating the long term disincentive for rehabilitation inherent in any periodic payments system. It is estimated that the average tort claim for lost time and non-pecuniary loss would be \$168,000 under the proposed system, compared to \$10,559 under the current system.

The permanent loss threshold system is predicted to cost \$225 million (Table VII-1). The tort damages for injury would fall by \$241 million (from \$335 million to \$134 million)⁴⁸ and the accident benefits would fall by \$90 million, giving a net saving of \$106 million or about \$20 per vehicle. In addition, there would be savings of \$134 million in other programs, provided they all chose to integrate with the automobile benefits, which seems likely in the case of private insurance and workers' compensation. Integration may be more difficult to achieve for federal programs such as Unemployment and the Canada

TABLE VII-1

Costs of A Threshold System For Personal Injuries
No-Fault Benefits Paid For Four Years, Tort Thereafter

	Aggregate (million \$)	Per Vehicle (\$)
Gross Benefits	225	43
Change In Cost Of		
Accident Benefits	- 90	- 17
Tort Damages	- 241	- 46
	<hr/>	<hr/>
Net Cost	- 106	- 20
Change In Cost Of WC, CPP, LTD, STD, and UI	- 134	- 26
	<hr/>	<hr/>
Net Cost	- 240	- 46

Note: These figures do not take into account compensation for medical expenses. The tort figures include non-pecuniary loss and compensation for lost earnings only.

Pension Plan. The net reduction in the cost of compensating injured victims would be \$240 million or \$44 per vehicle.

The savings realized would not necessarily represent a gain from society's point of view. From an insurance perspective there would be benefits because compensation would more nearly reflect losses for many individuals who are currently over-insured or under-insured. There would be additional benefits if the proposed system could be administered at a lower cost than the current system.⁴⁹ The social cost of the change would be the result of reduced incentives to take care when driving. The reduced incentives would occur because the fault-based compensation would become a smaller percentage of total compensation.

ENDNOTES

1. The aggregate tort damages were similar under the alternative approach (\$353 million) but the distribution of the damages among victims is very different.
2. Benefit levels in the CPP and unemployment insurance are based on previous annual earnings, but those with earnings at the maximum annual insurable amounts will receive maximum weekly benefits.
3. The amount is discounted by 50% for some drivers because of contributory negligence.
4. There are some exclusions for those committing suicide, those convicted of impaired driving and those not authorized to drive the vehicle, but these are not captured in the model.
5. There were 5,218,392 registered vehicles in 1985. Ontario Ministry of Transportation and Communications, Ontario Road Safety Annual Report, 1985, p.8.
6. The tort damages were predicted using the estimates from the Eckler data.
7. These savings may be small. Under the current system the legal expenses are concentrated in the serious cases that would remain in the tort system. Furthermore, there would be more claimants under the proposed system, thereby adding to administrative costs.
8. The only recent Ontario Interministerial Task Force on Motor Vehicle Injuries, Injury: An Ontario Survey of the Societal and Personal Costs of Hospitalized Motor Vehicle Accident Victims, Summary, and Technical Report, July 1981. In the United States there is a recent study by John E. Rolph, et al., Automobile Accident Compensation, 3 vols., Rand Institute for Civil Justice, 1985.
9. Data provided by Health and Welfare Canada.
10. Canadian Life and Health Insurance Association, Survey of Health Benefits in Canada, 1985, Table 4.

11. This latter provision applies only if the victim is between the ages of 18 and 64.

12. The single parent is not subject to the same requirements concerning job search that are imposed on the head of a two-parent family.

13. Ontario Ministry of Health, Survey of Non-Institutionalized Physically Handicapped Persons in Ontario, July 1982.

14. Ibid., pp. 43-44.

15. Statistics Canada, Report on the Canadian Health and Disability Survey: 1983-1984. (Cat. 82-555E).

16. Op. cit., p. 10.

17. Op. cit., p. 50.

18. Ibid.

19. This assumes that the permanently disabled have the same life expectancy as the rest of the population. The calculations were based on survival data in Statistics Canada, Life Tables: Canada and Provinces: 1980-1982, May 1984. (Cat. 84-532).

20. Statistics Canada, Results from the Absence from Work Surveys: 1978 to 1981, November 1982, p. 107. (Research Paper 32).

21. Ibid., p. 103. In 1981, 7.5% of the total absent received compensation from more than one source.

22. 1986 Automobile Insurance Experience ("Green Book") (Toronto: Insurance Bureau of Canada, 1987).

23. Ibid., p. 290.

24. Unpublished data provided by the Insurance Bureau of Canada.

25. These data are called the Public Use Sample Tape.

26. Bicyclists are considered drivers.

27. The probability of injury was adjusted upwards by 1.059% for women and .536% for women to allow for those whose age was unknown.

28. Given the large number of 16 to 34 year old men who are injured, each man in that category on the census tape had to be given two chances to be injured in order to give the correct number of injured persons. In other words, some young men will appear twice in the injured population data set. They become two separate individuals in the new data set and will most likely have different characteristics concerning the type of accident and extent of disability.

29. This total differs slightly from the published total because of the omission of those with unknown sex from the tabulations and because the data received from the Ministry of Transportation and Communications reflects revisions since the 1985 Ontario Road Safety Annual Report was published.

30. Ontario Interministerial Task Force on Motor Vehicle Injuries, Injury: An Ontario Survey of the Societal and Personal Costs of Hospitalized Motor Vehicle Accident Victims: Technical Report, July 1981, p. 128.

31. Submission by Insurance Bureau of Canada to The Honourable Mr. Justice Coulter A. Osborne, Inquiry Into Motor Vehicle Accident Compensation in Ontario, April 1987, exhibit II-11.

32. The percentage of injured victims with lost time does not exactly equal 56.9% because of the stochastic process used to assign time loss to victims.

33. Regie de l'assurance automobile, Bilan 1984 - Tome 1, p. 14; Tome 2, p. 42.

34. Nielsen v. Kaufmann (1976), 54 O.R. (2d) 188 (Ont. C.A.). In this case the lower court based the loss on \$8,840 per year. The Court of Appeal reduced the figure because the victim would have worked full-time for part of her life. The Court of Appeal cautioned against the use of rigid arithmetic procedures (based on the cost of a housekeeper) for valuing this loss.

35. For review of this literature see Samuel A. Rea, Jr., "Taxes, Transfer, and the Family," University of Toronto Law Journal 34 (1984): 314.

36. Statistics Canada. Consumer Income and Expenditure Division. Research and Analysis Section, Revision of Low Income Cut-offs, 1973, p. 7. The newer version of the low income cutoffs contain implicit dependency ratios which are inconsistent as the family size grows. See Statistics Canada, Income Distributions by Size in Canada: 1980, 1982, pp. 120-125. (Catalogue 13-207).

37. A structured settlement would also avoid all taxes.

38. Ministry of Labour, Provisions in Major Collective Agreements in Canada Covering 500 and More Employees, 1985, p. 175, provides the number of covered employees by industry.

39. The data file at Ministry of Transportation and Communications would permit one to extract this information, but this was not feasible in the limited time available.

40. The aggregate tort damages were similar under the alternative approach (\$353 million) but the distribution of the damages among victims is very different, as discussed below.

41. One reason for a close correspondence between the two numbers is that the Accident Benefits weekly benefit for those with no other pension equals the assumed value of time loss. However, these benefits are only 14% of the aggregate benefits.

42. In the model these programs are mutually exclusive. In practice, someone who exhausts his employer leave can apply for unemployment insurance.

43. Benefit levels in the CPP and unemployment insurance are based on previous annual earnings, but those with earnings at the maximum annual insurable amounts will receive maximum weekly benefits.

44. The amount is discounted by 50% for some drivers.

45. There are some exclusions for those committing suicide, those convicted of impaired driving, and those not authorized to drive the vehicle, but these are not captured in the model.

46. Ontario Ministry of Transportation and Communications, Ontario Road Safety Annual Report, 1985, p. 29.

47. There were 5,218,392 registered vehicles in 1985. Ontario Ministry of Transportation and Communications, Ontario Road Safety Annual Report, 1985, p. 8.

48. The tort damages were predicted using the estimates from the Eckler data.

49. These savings may be small. Under the current system the legal expenses are concentrated in the serious cases that would remain in the tort system. Furthermore, there would be more claimants under the proposed system (those out of the labour force, primarily), thereby adding to administrative costs.

THE FUNCTION OF DETERRENCE
IN MOTOR VEHICLE ACCIDENT
COMPENSATION SCHEMES

Prepared for the Inquiry Into Motor
Vehicle Accident Compensation in Ontario

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A. THE QUESTION

Following the introduction of no-fault compensation schemes, there have been recorded increases in mortality, morbidity, and property damage rates related to Motor Vehicle Accidents (MVA). Two professional groups involved in thinking seriously about these matters, lawyers and traffic/safety experts, have raised a question as to whether the increases might be due to the elimination of some deterrent influence previously coming from the tort system.

Unfortunately, the concepts or hypothetical mechanisms for which the term 'deterrence' serves as a label, are not the same for the two groups and, for each, there is some fuzziness about what they are. Since both groups generally believe in deterrence, there has not been much stimulus for the sort of learned dispute which might clarify these notions. Each, hearing the other affirm the existence of this influence, seems to assume that its own meaning applies. Members of either group accept that the word has some definite meaning, even if their own personal grasp is vague or incomplete. There is a resulting tendency to slide uncritically into consensus about how to understand the events surrounding changes in compensation schemes.

The target argument is that rate increases result from lost deterrence. Its structure gives us three issues to consider: the quality of the evidence; the quality of the concepts; and the quality of the logic which conjoins evidence and concepts.

B. THE EVIDENCE

Data from a number of jurisdictions are apparently consistent with the hypothesis that introducing a no-fault system releases the driving population from some restraining influence which had been suppressing MVA-related rates. They cannot, however, be construed as proof. There have, on the other hand, been no studies showing that MVA-related rates go down after the introduction of no-fault compensation schemes.

The data in question are all retrospective. This means that the measures were chosen largely from amongst

existing routinely-gathered data and compared to similar data compiled before the change. This does not by itself reduce the value of these data but, had the research been devised in advance, it would have been possible to select measures which more directly tested the hypothesis. No 'process' measures related to deterrence have been reported.

In no situation have there been experimental conditions applied; that is, there has not been a randomly-selected no-fault group compared to a fault-system group in otherwise identical circumstances. In no situation has the change in compensation scheme been the only significant factor affecting accident rates. In no situation have measures been repeated in a system reverting from no-fault to its alternative.

Data-gathering methods have not been reported in much detail, and have varied somewhat, but in the main consist of record reviews. There is some question about the reliability of data entry into official systems and this becomes especially important when MVA-reporting is hypothesized to be one of the behaviours affected by the type of compensation scheme.

The data have been assembled and analyzed using a number of statistical techniques. Some of these analyses have been criticized on technical grounds, and their conclusions queried because they did not sufficiently take into account a variety of possible confounding factors. However, in no instance would the effect of such criticism, if accepted, have been to change the direction of the conclusions; that is, only the magnitude of the supposed influence would be affected.

The quality of the evidence falls short of the standards required by scientific investigation, but is typical of what is generally available in the uncontrived study of natural social phenomena. Since it is exceedingly improbable that there will ever be a properly designed experiment, it is the only type of quantitative evidence we shall ever have. It should be accepted only with reservations.

C. CONCEPTS

1. Different Meanings

To address this question usefully, we must clarify what is meant by 'deterrence' and specify how it is assumed to act. If, as would seem likely, there is a number of socio-behavioural influences summarized by one term, each must be examined separately. For each, the question is: "Can increased rates be explained by the loss/removal of (this) deterrence?"

For everyone, 'deterrence' suggests that some act, event or phenomenon is being delayed, diminished or prevented. Included is the sense that something would occur but for this influence, i.e., that there exists an active tendency toward the occurrence. In the context of driving behaviour, then, the implication is that there is a tendency toward MVAs. This tendency is dampened when some hypothetical 'deterrence' is in effect, and amplified when it is removed. The implication is important because our prevention strategies are thus determined by a supposition that the 'natural' inclination of the average driver is to have as many accidents as can be gotten away with, and this supposition has by no means been proven. A subtle and problematic variant of this view is the 'risk-equilibrium theory' which involves an unconscious (both individually and collectively) weighing and adjusting of risk factors so as to maintain a fairly constant rate of calamity.

To be more clear about the construct(s) underlying the terms, we should specify the 'what' which is being deterred. Since this may not apply uniformly across the population, we must also identify the 'who'. Then, the meaningful use of the term requires that we also have a rough idea of the 'how'. To some extent, we find ourselves building a deterrence construct after-the-fact, because the word is already in use and its connotations are quite influential. This means trying to divine what people mean in using the term, even when they might not be aware of their own meanings. It is the kind of definitional exercise which leads to spirited dispute if it takes a counter-intuitive or unwelcome direction.

Amongst lawyers and judges, it is a fondly (though not unanimously) held belief that the tort system exerts some

restraining influence upon community behaviour. In its most primitive form, this belief is based upon the assumption that people wish simply to avoid penalty in the form of either payment or blame. The tradition within which traffic safety researchers work has long seen economic motivation as the pivotal determinant of vehicle-related behaviour and has employed 'deterrent' as a rough antonym to 'incentive'. The economics assumption is that all behaviour reflects a balance of restraining and encouraging forces to which values can, at least in principle, be assigned. The simplest form of evaluation is monetary, but, understood broadly, the notion also encompasses 'social cost' and personal utility.

Thus, the legal and traffic safety views may converge theoretically at some point. However, particularly where liability insurance is mandatory, they differ significantly in emphasis. The legal supposition is of a relatively subtle and abstract influence upon attitudes concerning the individual's relationship with his or her social environment. The traffic safety supposition is of an influence based upon calculation of self-interest.

For both, the driver in an MVA is aware under a no-fault system that there is no process for determining non-criminal responsibility and that compensation will not be contingent upon any such determination. In the traffic safety view, the driver has 'nothing to lose' (disregarding inconvenience, physical risk, etc.) and, with the balance of disincentives and incentives having shifted, the invisible economic hand will push up MVA-related rates. In the lawyers' view, removing the process by itself affects community values and, hence, behaviour in a way which need not be mediated by considerations of personal loss or gain.

2. Non-Specific Deterrence

In the traffic safety literature, the terms 'deterrence' and 'general deterrence' are used interchangeably to denote a collection of influences, variably specified, which are understood to determine the probability/frequency of MVAs. Although this deterrence involved other factors (such as quality of roads and design of circulation patterns), it is usually understood to revolve around driving behaviour. Some attempts have been made to determine the mechanisms within this behavioural 'black

box', most of them leaning rather heavily upon the utility theory (sometimes in the form of an 'expected utility model', or EUM) employed by economists. The driver is supposed within this conceptual framework to compare the utilities of competing alternative forms of driving behaviour and to choose the optimum mix. Most utilities can be expressed in cost terms, and one of the approximations accepted by this way of thinking is that the 'choices' are made more or less rationally. This approach has enjoyed rather limited success in explaining actual driving behaviour.

For the purposes of this brief, to avoid confusion with the 'General Deterrence' described below, this type of accident inhibition is labelled herein as 'non-specific deterrence'. Since we know that certain activities (seatbelts/airbags, no drinking, lower speed, compliance with laws, good vehicle maintenance and defensive driving) protect against accidents, we are able to specify some of its proximate components, and even more distally to identify such systems' features as rigorous enforcement, but there has been no comprehensive model to account for these hypothesized influences upon driving behaviours.

3. Specific Deterrence

Amongst both traffic safety experts and lawyers, there is the not unreasonable belief that the experience of some driving-related misadventure will affect a driver's behaviour, usually for the better. People tend to underestimate risks to themselves and tend to overestimate their driving abilities as compared to other drivers. Accordingly, they are relatively impervious to public educational messages and other inputs which might improve their driving performance. Although the effect occurs unevenly, it has been shown that accidents, injuries or penalized infractions do tend to sensitize drivers somewhat. Since the lifetime probability of being in an accident is quite substantial, and since there appears to be some concentration of accident events in an especially accident prone driver population, it would seem useful to enhance as much as possible the 'lesson' connected with each accident event. It is also true that there is a circle of driving friends and family members around each person who has had an accident, and it can be argued that some of this lesson is not lost upon them.

To borrow from sentencing usage, this way of preventing the further occurrence of undesirable behaviour may be labelled 'specific deterrence'. It is worth distinguishing from the 'general deterrence' described below because, although there is necessarily and desirably some overlap, the social and psychological processes involved in the two forms are different. In the case of specific deterrence, our objective should be to seek the maximum behaviour-change impact from each accident experience. This is not as good as preventing the first accident from occurring, but it does involve a significant part of the driver population.

4. General Deterrence

The term 'general deterrence', as used here, is also derived from sentencing language and is intended to label a broad community effect aimed at the 'primary prevention' of accident-causing behaviour by everyone, especially those who have not yet been 'offenders'. Although it could be hoped that this influence would also be felt by people who have already been in accidents, its main target is amongst those who have not yet been sensitized in this way.

This general community deterrence held to be one of the proper functions of the tort system occurs through a complex and subtle inculcation of norms, expectations and proprieties; that is, its most important effect is upon attitudes about standards of behaviour and obligations to one's fellow community members. The process is not well understood, but it must be less direct, more diffuse, and slower than those of either the non-specific or specific types. In broad terms, the 'what' is accident-producing behaviour and the 'who' is the not yet accident-affected driving public. To understand general deterrence usefully, the genesis of driving behaviours must be traced, which will give some indication of the 'how'. It is worth noting that embedded in the term 'deterrence' when applied to MVA production, there is a double negative: we are speaking of preventing a negative behaviour when we could as easily be speaking of promoting a positive one.

A description of general and specific deterrence, linked to models of MVA production and driving behaviour, is presented in Section E: "DETERRENCE AND DRIVING".

D. THE ARGUMENT

1. Illusory Proof

Superficially, it would seem that the data do support the idea of the existence (or removal) of 'deterrence'. There are good dialectical and theoretical reasons for believing that the tort system does exert some influence on the direction of socially responsible behaviour and there are measures which, while scientifically imperfect, do consistently show increased MVA-related rates with the institution of no-fault systems. It would be mistaken, nonetheless, to take from these studies that the data prove anything with respect to deterrence. It is as if we had been offered a hypothesis: if fault-finding in the tort system deters, then its removal will be followed by (result in) increased MVA-related rates. When rates do go up, the data are taken as confirmation of the deterrence proposition. This confirmation then, somewhat circularly, provides an explanation for the data.

2. The Non-Specific Association

For non-specific 'deterrence', there would seem to be the most compelling case, but it is based upon a semantic confusion. Recall that, as used by traffic and safety people, this form of the term implies a shift in the balance of restraining and encouraging forces (or of disincentives and incentives), with the implicit and unsupported assumption that the shift is occurring because restraints or disincentives are being reduced. With a more sophisticated formulation, the model becomes explicit and the language changes: we have an 'MVA production system' of which some variables change in response to altering conditions within the system.

If it could be shown convincingly that, with confounding variables controlled or eliminated, there were repeated and consistent increases in MVA-related rates following the institution of no-fault schemes, then it would be prudent to infer some causal relationship. However, even under these circumstances, we could say nothing about the role of 'deterrence' in its other meanings. Since confounding variables have not been controlled, and since we have not seen the opposite effect in response to the imposition of a fault system, we are not in a position to conclude very much at all. We must keep in mind that we

are considering a very large system with an enormous number of elements and exceedingly complex interactions: to infer causality between one (amongst many) local system change and another event at a different level of organization, after so few trials, would be incautious.

One persuasive argument in support of which there is much anecdotal evidence is that businesses can and do calculate risks and, thus, may be deterred from exposure to fault for simple economic reasons. To assume that the same reasoning process governs individual driving behaviour is not valid.

3. An Alternative Assumption

Without the presupposition of some 'deterrence', one might not think first about the removal of a restraint when a no-fault scheme is introduced and rates go up. It would be at least as direct and logically parsimonious to presume that some factor(s) had been added to the MVA production system. Arguments have indeed been made for the contribution of such 'new' factors as an increase in the proportion of high risk drivers in the licensed pool and changes in reporting behaviours. There might, of course, be a combination of 'added' and 'subtracted' factors. Since step-by-step controlled research is impossible, it would be exceedingly difficult to apportion causal responsibility between such factors. If they interact (so that, for example, the removal of a deterrence selectively influences the sub-population which has been given freer access to driving privileges and which exhibits more labile reporting habits), then the difficulty is aggravated.

4. Data Collected Before the Effect

The greatest problem, specifically with respect to 'general deterrence', arises from the fact that the 'post-change' data have all been collected during a relatively brief (generally one year) period immediately following the change in compensation scheme. For it reasonably to be believed that increased MVA-related rates support a (general) deterrence hypothesis, one must assume that the effects of a hypothesized restraint removal would be evident within this early period. This issue is addressed in the following section.

E. DETERRENCE AND DRIVING

1. How Does Deterrence Work?

It would probably be useful, within the whole realm of 'deterrence', to see two kinds of influence directed toward two essentially different populations. These correspond roughly to the 'general' and 'specific' varieties of deterrence, but they are qualitatively more different from one another than are these kinds of deterrence in a criminal context. An important problem with the term 'deterrence', as noted above, is that it carries the connotational baggage of temptation. It is as if there were something naturally and fundamentally pleasurable, valuable and desirable about doing and being the things which lead to the production of MVAs. There is an analogy in public health work, where prevention programmes must combat the belief that there is something intrinsically pleasurable, and therefore tempting, about smoking, poor diet and sedentary lifestyle. These latter two having been designated sins ('gluttony' and 'sloth') in our socio-religious traditions, have acquired a kind of perverse value. In fact, to acquire a tobacco addiction requires withstanding and overcoming a good deal of unpleasure; healthy nutrition is demonstrably more pleasant than its alternatives, and increasing legions of the newly-fit attest to the preferability of an active lifestyle. Health promotion must work against the peculiar prevailing assumption that one must sacrifice pleasure to feel better.

In the driving world, the parallel assumption is that the fewer the constraints, the less attention to sound driving technique, and the less regard for the welfare of others, the more enjoyable driving would be. There is, in this view, a kind of animal urge struggling to get out from beneath a wet blanket of social restriction. It is the inclination to give free rein to this urge which is being deterred.

The urge may exist, but it is not 'natural', in the sense that it is the inevitable expression of something essential in our driving natures. It is a socio-cultural artifact, about three-quarters of a century old, which has been assiduously and expensively cultivated by huge commercial interests. (The parallels with the tobacco and food industries are compelling.) If there is an inclina-

tion to drive recklessly (sportily, adventurously, masculinely), then to create a social apparatus aimed at the constraint of an unfortunate aspect of human nature is to use the wrong arrow for the wrong target. It would make more sense to constrain those interests (the auto manufacturing and auto sport industries) which propagate the myth.

If we adopt a health promotion-like viewpoint, then general deterrence begins to look less like the inhibition of essentially tempting proclivities and more like the encouragement of potentially pleasurable, or at least neutral, safety-generating behaviours. The temptation-and-enforcement point of view supposes that there will be a necessary resistance to the acquisition of good driving habits, so that the teaching must have teeth in it. To see general deterrence as a positive process of encouragement, rather than a negative one of suppressing tasty mischief, has important implications for how we understand the impact of the tort system on driving behaviour. We then appraise the role of the tort system as a guiding and teaching instrument, rather than a mechanism for the distribution of penalty. It means that we assume, as would seem appropriate, a higher level of community moral development wherein the adherence to principles is more important than the avoidance of penalty.

The 'specific deterrence' notion, in its usual sense, is strategically identical to a good spanking. Here too, there is the hint that something worthwhile to the individual is being made unavailable in the interests of the community. Whether or not some accident producer-victims might have a taste for unsafe driving behaviours, however, the general descriptive statement about this population is that they have proven themselves at higher risk than the remainder of the driving population. Therefore, if we understand driving behaviours to be the products of many complex interactions, the reduction of this accident risk potential would properly consist of addressing several or all of them. To adopt the strategic presumption that the only 'cause' is the giving-in to selfish temptation would result in a very narrow approach. Yet, since there is an expert consensus that driver attitudes are central to this whole MVA production system, there would seem to be considerable merit in 'teaching a lesson' to these drivers, if it is understood to be more pedagogic than punitive.

The suggestion here is that for our purposes we consider what has been called 'general deterrence' as (part of) the encouragement of safe driving patterns in a way which is closely akin to health promotion. We should also re-define 'specific deterrence' so that we understand it as the re-education or rehabilitation of drivers whose accident-hood has shown them to be members of a high risk population. For the reduction of MVAs, the two populations require different approaches just as, for example, the prevention of first smoking requires a different approach from that needed for cessation. Although defining these populations solely on the basis of accident occurrence is crude, it is for now the best way we have.

If the tort system has a role to play in reducing MVAs, a role which until now has been known as 'deterrence', it will be along the lines of these promotion and rehabilitation influences. To the extent that the tort system actually is deterring people from giving into temptation, it must be emphasized that this temptation is being deliberately produced by another social institution.

2. Accident Production and Driving Behaviour

There have been hundreds of models proposed to account for the behaviour of traffic systems and of the drivers involved. Many of them directly or indirectly purport to account for variations in safety; i.e., for varying probabilities/frequencies of MVAs. These models have a variety of structural features and are based on a number of theoretical positions. However, they share certain features, and there have been discernable trends over the last couple of decades, so that it is possible to offer a modern composite depiction, which can claim to express the consensus of the field. What follows is a rough outline of such a summary model.

There are five main elements which interact to produce MVAs: the traffic-circulation system, vehicle characteristics, laws and their enforcement, geophysical conditions and driver behaviour. The interactions between these elements are subtle and complex (e.g., vehicle designs/sales adapting to road conditions, and road design adjusting to size of vehicle), and all except geophysical conditions are socio-culturally determined, but the one most germane to this discussion is driver behaviour. It

interacts with all of the other four elements although, in the case of geophysical conditions, the interaction is only in one direction. It is necessary to recognize the sub-components of each of these elements because the interactions are sometimes between them.

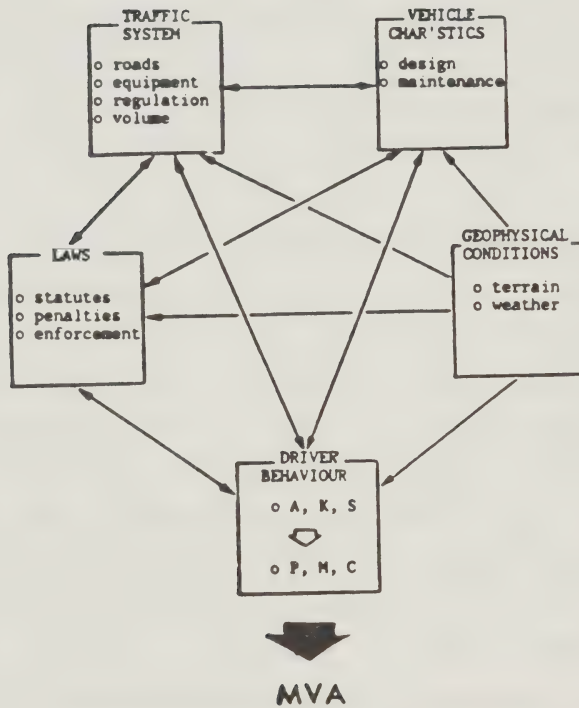


FIGURE 1: A simplified composite normative model of the MVA-production system.

A great deal of work has been done on the determinants of driving behaviours, focusing upon physical attributes, skills and, increasingly, cognition. Included in cognition are perceptions, judgments, interpretations of events, emotional reactions and attitudes. These all interact (indeed, in the view of many cognitive scientists, are operationally inseparable), and their general direction is believed to be governed by a combination of role and attitude. That is, a fundamental (perhaps the fundamental) determinant of the quality of driving behaviour is what the driver senses her/his driver-role to be, together with the attitudes linked to that role. It is this role/attitude factor which safety campaigns and driver education courses attempt to influence with, at best, qualified success. The difficulty in affecting this cognitive factor is believed to be that it is already formed by the time driver training occurs, and is more strongly affected by general community influences than by specific interventions.

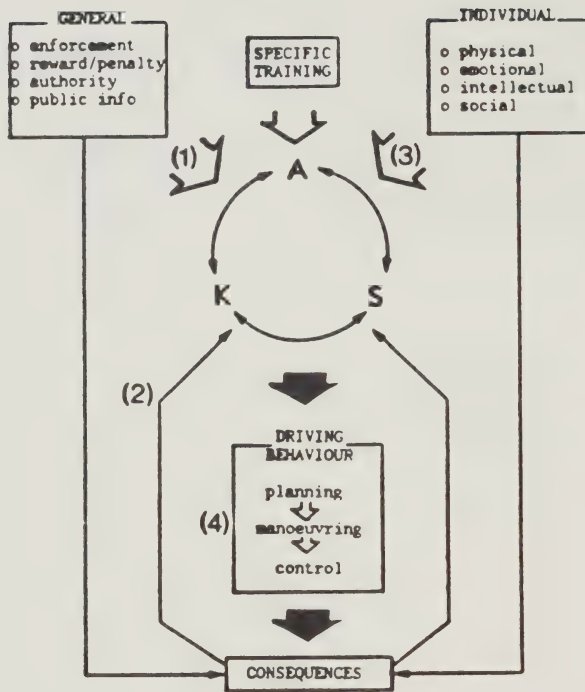


FIGURE 2: The determinants of driver behaviour, based upon the interaction of attitudes (A), knowledge/beliefs (K), and skills (S).

In Figure 2 (page 451), actual driving behaviour results from interactions between three clusters of individual attributes: attitudes, knowledge/beliefs and skills. The 'attitudes' include the person's sense of identity/role as a driver (e.g., warrior, athlete/competitor, adversary, cooperator, etc.), estimate of risk, assumption of responsibility and so on. The person's knowledge/beliefs range from obvious rules of driving to knowing correct tire pressures. Skills involve motor skills, procedural habits (where to look when changing direction), reaction habits (modulating strength of response to urgent demand) and thought-mediated problem-solving. These clusters are not mutually exclusive as there are cognitive skills (between knowledge and skills), automatic responses based in habitual evaluations (between skills and attitudes) and philosophical convictions (between attitudes and knowledge).

This interactive AKS-complex is affected by general factors in the social environment and by personal factors. The general factors include law enforcement, fiscal rewards/penalties, the views of authorities and public information/education. Personal or individual factors include physical, emotional, intellectual and social attributes.

The actual driving behaviours can be arrayed hierarchically and, thus, seen to be involved in Planning (most general), Manoeuvring (intermediate) and Control (most specific). Planning requires at least minutes, but can last much longer. Manoeuvring occurs within seconds. Control occurs within fractions of seconds. Any complex repetitive task becomes increasingly automatic and the less time there is to think about such a task, the more adaptively necessary it is for this automaticity to occur. This means that the first behaviours to become automatic are at the 'control' level, and the last at the 'planning' level. Automatic behaviours are relatively stereotyped, occur by 'training' and, in psychological terminology, are often 'over-learned'. It is important for them to be safe for the widest possible range of circumstances. During their development, they are heavily determined by attitudes. Then, once established, they actually influence the beliefs and attitudes which complement them.

The figures and institutions in our society who are invested with sapiential and moral authority teach, guide

and set standards in many realms of behaviour. The courts have a central role here but, besides judges and attorneys, there are accountants, physicians, law enforcement personnel and the media, who all deal with the consequences of MVAs and have this 'General' influence on the AKS complex (see #1). Public information, through health agencies, ministries and schools, also has an impact upon knowledge and attitudes and is aided by the background presence of a concrete social instrument for determining the correctness of driving behaviour. The consequences of driving behaviour, whether right behaviour or wrong, and whether actual or anticipated, have a lot to do with subsequent driving conduct. Here again the institutional reality of a rightness-judging process strengthens this feedback (see #2).

As the norms, expectations and proprieties permeate the social character of the community, they affect the openness of individuals to benefit from training, be sensitive to information and respond adaptively to driving experience (see #3). The hope is that these attitudes will be influential at the 'planning' level where risk avoidance is most effective, at the 'manoeuvring' level where role identity, personality and emotional tendencies are expressed, and in the formation of the pre-learned habits which come into play at the 'control' level (see #4).

3. Social Attitudes and the Fault System

The most desirable cognitive set for a driver to take behind the wheel is that of a socially responsible community member whose obligation is to perform driving functions in a technically correct and vigilantly cooperative manner. This set includes a sense that one is accountable to the people in one's environment for one's behaviour. It means the self-discipline (a moralistic way of referring to a habit) to maintain an awareness of risk to others. It requires a shared folk-knowledge that there are means and ways by which this accountability may actually happen.

People generally perceive three kinds of liability connected with driving: criminal, 'quasi-legal' and civil. Studies suggest that all but a tiny minority of us regard ourselves as non-criminal, and the criminal justice system is therefore irrelevant to us. The 'quasi-legal'

area includes, notably, most traffic offences. People are more inconvenienced than either embarrassed or threatened by the usual offences and fines which are regarded as routine costs of transportation. Being 'at-fault' in making an illegal turn has little emotional impact. Auto accidents, on the other hand, are major emotional events and the prospect of being held blameful in such an event is not unimportant. Thus, although the sanctions may be least tangible (if an insurer pays), the average citizen-driver is most influenced by the possibility of civil liability.

If it is accepted that the 'correct and responsible' role is important for the prevention of motor vehicle accidents, then the values and attitudes supporting this role are correspondingly important and anything which, in turn, promotes them is strategically valuable. The tort system performs this function. People in our society can see in it a demonstration of how we value each other and of what the rules are by which we are held accountable. That is, it is a representation of one's responsibility to the community.

The trial-in-court part of the tort system is a crystallization of that responsibility-fact. One stands before one's fellows to be judged blameless or at fault. It is a fundamentally important form of civic theatre where we represent ourselves to ourselves. What has come down to us as 'drama' and is now considered one of the arts, was originally created for just this purpose. Originally (and now in other societies) religious, legislative and judicial dramas were 'acted out' together. In our current society, we separate these functions into churches, legislatures and courts. In each, we are accountable to a higher authority upon which our community agrees, but we have separated the authorities. Because the tort system has this representational function, it is less important because of what it does than because of what it is. It is our final referent when we are trying to understand how to resolve social conflicts or how to make real some abstract notion of one's responsibility to others in the community.

This representational influence is slow and indirect. It contributes, over the long term, to that sense of collective obligation which is the basis of the civility for which Canadian society is noted. It is a kind of drama

which need not be dramatic. It need not even be particularly visible. Another institution in this country, the office of Governor-General, has day-to-day impact on the lives of Canadians, though we are seldom aware of it. We distinguish our Head of State from our Head of Government with the result that the citizens of this country have at least a vague sense that our Prime Minister is, however powerful, still accountable to someone/something else. The person elected to be first amongst us has to regard himself as accountable through an institution which is more important for what it is than what it does: so too, the lesson goes, does each of us have to feel responsible to our community.

At first glance, then, the argument that the tort system has a 'deterrent' influence would seem to depend upon public awareness of how the system works and upon each potentially accident-producing individual making a personal risk calculation in the context of that awareness. Although there are no studies of the level of public awareness of the tort system, one survey suggests that despite recent campaigns, public awareness about the penalties for drunken driving is minimal. It is reasonable to suppose that detailed knowledge about what happens in civil litigation is scanty. The informal experience of lawyers with new clients, and in the community, confirms this supposition. It appears that if the tort system does have an influence it is not mediated by even a latent knowledge about, much less a constant awareness of, its workings.

The idea that drivers make personal risk calculations is problematic. A great deal of traffic safety research indicates that quick driving decisions are made, without conscious thought, on the basis of a combination of physical factors and habit. The motivating direction for such 'reactions' (rather than 'decisions') is personal survival, followed by the survival of others and the protection of one's vehicle. In most acute situations, there is no time to perform calculation, even if a person were able and inclined to do it. Traffic safety promotion is really based upon the idea of keeping people out of such situations in the first place; that is, by focusing upon planning and manoeuvring. This is where social perceptions, attitudes and roles come into play.

However, even if most drivers do not actually think about the workings of the system, their behaviour is affected by something like a pre-verbal impression of what it is and, particularly, of their place in it. This sense of relation is important because in the study of institutional and community behaviour, it has been found again and again that people who have a personal stake in events behave more responsibly. A complementary finding has been that cooperative behaviour is increased when a person perceives those around him as sharing that stake. This makes it crucial that drivers maintain a sense of 'ownership' in connection with the issue of traffic safety. It must remain personal, rather than being allowed to become a de-humanized administrative mechanism. The possibility, even (perhaps particularly) if a bit abstract and mysterious, of being personally accountable increases this personalization. The personal connection, making it more difficult for the driver to evade a sense of road responsibility, would be enhanced if the consequences were made more concrete and severe (as in, e.g., increased insurance premiums and, especially, punitive damages). For the specific-rehabilitative kind of 'deterrence', they would serve to capture the driver's attention and encourage a private re-appraisal of habits and attitudes. For the general-promotive kind of 'deterrence', their existence has more effect than their application. For everyone, they affirm the seriousness with which society regards this matter.

The point is that if the existence of the tort system exerts an effect through its functions in representing collective responsibility to the community, we must expect that its effects would be subtle, complex and slow. The elimination of this institution on a Friday would not be reflected in altered social attitudes the next Monday morning; nor, if a 'fault' system were eliminated in one year, should we expect the absence of its influence to be evident the next. If changes in social attitude were to occur, it might not be for five years, a decade or a generation.

There are examples around us of other comparable changes in social attitude which have occurred over a similar period. It has taken three decades for well-documented and widely circulated knowledge of tobacco hazards for smoking to become regarded as anti-social behaviour. It has taken two decades for substantial

changes to take place in the status of women in our society. The social unacceptability of drunk driving has occurred over one decade. We do not know how long it will take to change our private transportation system so as to reduce the carnage of perhaps the greatest epidemic in history. If there are existing social attitude promoting forces which act as a brake on this slaughter, we also do not know how long it would take for their removal to show in increased traffic-death statistics.

4. The Ultimate Issue: 'Deterrence' and the Epidemic

The deaths, injuries and costs from motor vehicle accidents constitute one of the great epidemics in history. In our society, given the ages of many victims and the consequent loss of healthy years, it can be argued that it is the greatest epidemic. In this epidemic, there are no exotic organisms and natural forces play a minor role. Prevention will be mostly behavioural and the key behaviour is that of the driver. There is virtually no disagreement that the most important influences on driver behaviour are socio-culturally determined attitudes and roles.

There are several cultural influences working in the wrong direction. Macho advertising and (industry sponsored) auto-racing both promote the view of driving as a competitive, ego-displaying opportunity for self-gratification through the demonstration of strength and status, and glorification of individual risk-taking. We need some competing influences, such as education, restrictions on 'lifestyle' advertising and the elimination of auto 'sport'. Behind all our efforts to promote the 'competent and responsible' driver role, however, must be the living fact of a cultural apparatus which concretely represents our accountability for what we do with our vehicles.

Given the colossal scale of this epidemic, it would seem imprudent to tamper with an institution which may exercise some mortality and morbidity retarding effect, even if the effect is not empirically demonstrable. No one has ever proposed that it has a negative effect. Arguments related to the ultimate death and injury issue strongly suggest in fact that we strengthen, rather than weaken, the impact of the 'fault system'

F. HEALTH IMPLICATIONS

1. The Four Types of Argument

a. Efficiency: The most thoroughly argued case for, and against, the introduction of a no-fault scheme has to do with the cost of administering the system, the proper distribution of this cost, the waste of scarce court resources and the inappropriate allocation of resources to insurance companies and lawyers. It is interesting that so much time and media space should have been devoted to this aspect of the dispute (although perhaps not surprising, since the companies, ministries and professionals choreographing the dispute are organized around these fiscal concerns) because, in the long term, this is probably the least important of the arguments.

b. Fair and Timely Compensation: Probably the larger part of the emotional force behind the no-fault debate has risen out of an entirely commendable developing social sentiment that accident victims should not be deprived of compensation either because of litigation delays or because they have been found at fault. Behind this argument is an indignant sense that compensation mechanisms are unfair and unnecessarily complicated. Because there are interests which appear to be profiting from the delays, there has arisen a kind of reform zeal which tends to confuse the efficiency and compensation questions. The ferocity of arguments in this category is striking and they command our sympathies, but it is inappropriate that they dominate the whole debate, because problems around which they revolve would seem so easily solved.

c. The Epidemic: One of the two types of argument which has received virtually no attention has been that concerned with the unutterably awful human damage occurring every minute of every day in our road system. Virtually all considerations should pale beside this one. Our first concern should be to ensure that nothing is done to our system which worsens the problem and, if at all possible, that we effect changes to reduce it. If this were to increase costs then the debate should explicitly address 'health efficiency' issues. Although this may be one of the greatest epidemics in history, it is probably also the most invisible, which may account for this argument receiving so little attention.

d. Justice: Except from some jurists, there has been relatively little comment upon the broad social implications of tinkering with the law involved in this issue. The general public seems perversely uninterested in suggestions that they should be wary of having their rights shaved away in the interests of efficiency, and the zealots view such suggestions from lawyers as self-serving. Despite the lack of attention given them, the justice and epidemic arguments would seem to be the most fundamentally important.

2. Compensation Mechanisms

When someone has been injured in an MVA, he/she needs two kinds of 'compensation': the wherewithal to live decently, if his/her income has been interrupted or there are other unusual circumstances; and treatment-rehabilitation. Not only is it unfair for these to be withheld but, because of the ways we know that chronic disability develops, there are also serious ill-health consequences flowing from such delays.

However, there are simple administrative means by which adequate maintenance and care can be provided without any substantial changes to the fault system. Treatment and rehabilitation should be made available, without challenge by the paying insurer, immediately. This very probably will result in some excessive and avoidable 'front-end' costs, but they will be trivial in comparison to savings from the present costs of chronic disability. There would also be legal remedies available where abuse occurs. It is argued by some that since virtually everyone in Ontario is insured through OHIP, the 'care' part of this issue is already resolved. Unfortunately, much of the specific expertise most necessary in post-traumatic treatment and rehabilitation involves non-physicians, and should generally be applied in the community rather than the clinic, i.e., OHIP does not cover it. It is also, not just coincidentally, in short supply.

Seemingly, an obvious and simple solution would be to make changes in OHIP. However, even disregarding the boggy business of extending health disciplines privileges, we could face serious utilization problems because income maintenance almost inevitably would be tied to rehabilitation efforts. The New Zealand experience would suggest that if early rehabilitation (or 'pre-habilitation') were

made close to mandatory, there would be a significantly increased demand for services, mostly in non-physician activity. Costs, then, might not simply be relocated, but actually increased. To some extent, this increase would reflect 'uncovered' existing needs, but some of it would be newly created by the 'medicalization' of disability. It would not be sufficient, therefore, merely to increase the supply of conventional medical/clinical resources; service modes, professional roles and training programs would have to be adjusted according to the most advanced concepts of disability. Strategically, legal and administrative issues are inseparable from health issues. Together, they demand an integrated approach.

3. Changes in Concepts: Disability, Work and the Courts

Amongst the fundamental changes occurring in health care are our ideas about the nature of morbidity in general and, specific to our present purposes, of disability. Between the initial accident event and the eventual disability, there is a regular causal sequence, the logic of which is crucial to our understanding of how to manage these problems.

First, the 'cause' (in the form, say, of collision impact) interacts with the physical characteristics of the person to produce the tissue-metabolic damage we refer to as a 'lesion'. Then, this lesion interacts with the person's emotional-behavioural characteristics to produce the 'syndrome', which consists of all those distresses and dysfunctions we regard as symptomatic. This syndrome then interacts with the person's environment to produce the actual 'disability'.

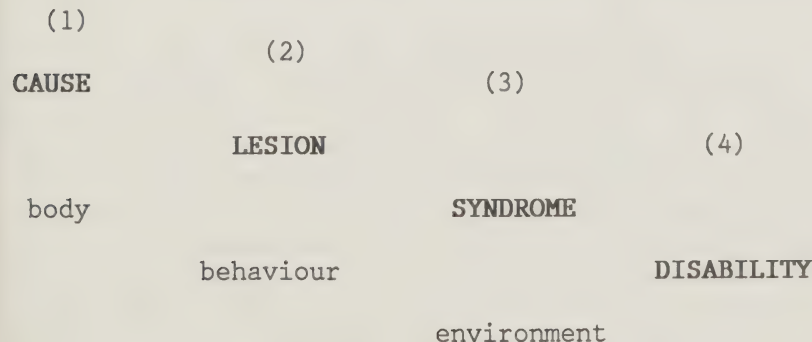


FIGURE 3: The step-wise genesis of disability.

Describing and assessing a disability is not the same as diagnosing a syndrome. Doctors are good at naming syndromes and inferring or finding the lesions which underlie them. They do this on the basis of history, clinical science and laboratory investigations, all of which procedures are carried out in a clinical setting. Conventionally, when asked to estimate someone's disability, they extrapolate from this diagnostic decision, sometimes including their best guess about the person's environment. When the patient in question is a professional athlete and has suffered a traumatic below-knee amputation, the guess and the extrapolation are easy. In the overwhelming majority of less obvious cases, however, neither the guess nor the extrapolation is of much value if the intention is to arrive at a precise assessment for either rehabilitation or compensation reasons. Physicians seldom possess the conceptual or technical tools because they are not trained in them, to conduct this kind of assessment properly. The data necessary for it are different from clinical data and they must be interpreted using a different kind of logic. The data gathering must be done largely in the person's real world and involves technical procedures which are quite unfamiliar in most clinics.

In parallel with this evolution or morbidity theory, there have been important changes in concepts of work and its place in our society. On the one hand, formal employment is recognized to be valued beyond the wage it brings and, on the other, informal ('avocational') work is increasingly seen as its social and economic equivalent. Social scientists in the field lean toward a consensus that substitutes for traditional job roles will become more necessary and valued and that this trend is accelerating.

Combining these developments in the concepts of disability and work, particularly where they converge around the 'value' of performance capacity, we can, within a decade, expect a very different logic to apply to the calculation of loss. This kind of thinking has only recently come into civil litigation and is evolving rapidly. Different kinds of assessment are being sought, the legitimacy of different lifestyles is acknowledged, and such hoary notions as 'traumatic neurosis' are being challenged. The quality of science brought into court, and its application, are improving, not least because, in the

competitive dynamism of the system, innovative attorneys are pushing one another to new levels of sophistication.

To freeze or retard this process would be regrettable. Even if compensation criteria were to be formulated according to the most advanced current thinking in the field (and it is improbable that we could do better than to codify what was state-of-the-craft five years ago), it would be significantly out of date within a few years. Given the usual half-life of complex legislation and regulation, we would be in for a long period of institutionalized obsolescence. Right now, the civil litigation process is not only benefitting from, but is also one of the most important stimuli for, this development of concepts at the interface between science and society. Reducing our decisions about the nature and value of disability, or about impacts on life quality, to administrative interpretations of tabulated definitions would be a regressive step. It is the approach itself, rather than just the quality of its contents, which is dangerous. Once in place, it is likely to breed bureaucratic absurdity. Attempting to modernize a verbal threshold formula, as in the Michigan example, can bring about silly results. There, in order to soften an inclusion criterion which insisted upon objective clinical evidence, thermographic data were allowed: the intention may have been laudable, but the results were scientifically indefensible, and a good cross-examining attorney could demolish the logic in short order.

The civil litigation process is serving us well as a crucible within which social and scientific ideas are brought together around questions of compensation. We should be very cautious about removing any of it.

G. SUMMARY

1. Although MVA-related rates do appear to rise following the introduction of no-fault schemes, it is not valid to infer that this effect is due to the removal of some anti-MVA 'deterrence' in any meaningful sense. Nonetheless, there are other reasons to believe that the tort system can/does exert both 'general deterrent' and 'specific deterrent' influences which act over a longer period.

2. The data suggest (but do not prove) that some features of no-fault schemes may actively influence driver behaviour negatively; that is, increases in post-change MVA-related rates are at least partly an active effect, rather than being due to the removal of some influence.
3. The question about 'deterrence' cannot be settled scientifically.
4. There are (at least) three meanings for the term 'deterrence': one refers to the balance or interaction of all forces in the 'MVA production system'; the other two resemble the general and specific deterrences in the criminal justice system, but are better thought of as influences for the promotion of safe driving and the rehabilitation of high risk drivers.
5. The tort system probably does exert these 'promotion' and 'rehabilitation' influences.
6. These influences can be located fairly specifically in an MVA production system model.
7. There are strong forces acting to generate precisely those behavioural tendencies which we seek to deter.
8. The influences act, and effects occur, slowly; that is, MVA-related rates measured during the first year after no-fault changes may be interesting for other reasons, but are unlikely to have anything to do with the 'promotion and rehabilitation' kind of deterrence at issue here.
9. Given the colossal scale of the traffic death and injury epidemic, even a small 'detering' influence is important; since the tort system probably has this influence, and has never been accused of having the opposite effect, it would be unwise to remove it.
10. Improvements in mechanisms for provision of care are possible, and desirable, independent of changes in the 'fault' system.
11. The rapid evolution of disability concepts must be considered in designing a compensation scheme.

INCENTIVES FOR SAFE DRIVING AND INSURANCE MANAGEMENT

An evaluation of the comparative feasibility and effectiveness of incentive programmes for safe driving in the general population under conditions of publicly- versus privately-administered automobile insurance.

Report Commissioned by and submitted to the
Inquiry into Motor Vehicle Accident
Compensation in Ontario

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SUMMARY

In the current debate in Ontario about the merits of private and public automobile insurance, little attention has so far been paid to the potential implications for road safety. In an attempt to fill this gap, this paper first describes the road safety strategy from which the largest reduction in the accident rate may be expected. This strategy takes the form of extending incentives to drivers for not becoming involved in an accident of their own fault. Next, potential sources of incentives available under the condition of private insurance are compared with those available when automobile insurance is assigned to the public sector. To be maximally effective, incentive programs must meet a set of requirements, and these have been specified. The ability of private and public insurance to fulfill these requirements has been compared. On the basis of the available evidence and the inferences that follow from it, this paper shows that the choice between private and public insurance may have major implications for the future traffic accident rate in the province. Consideration of all identified factors impinging upon the effectiveness of incentive programs, and thus upon accident reduction, leads to the conclusion that the objective of road safety promotion will be best served in Ontario if the responsibility for automobile accident insurance is assigned to the public sector.

RESUME

Dans les débats actuels en Ontario a l'égard des avantages d'une assurance automobile privée ou gérée par les autorités publiques, tres peu d'attention a été dévouée jusqu'ici aux implications potentielles pour la sécurité routiere. En visant a remplir cette lacune, ce rapport donne en premier lieu une description des mesures pour la promotion de la sécurité qui promettent le plus grand effet bénéfique. Celles-ci sont les mesures qui récompensent les conducteurs pour la conduite sans accidents dus a leur propre tort. Par la suite, la disponibilité des sources potentielles de récompenses ("boni") pour la conduite sure a été comparée dans la condition d'assurance gérée par le secteur public et par le secteur privé. Afin de pouvoir réaliser le plus grand effet sur la sécurité, les programmes de récompenses doivent répondre a un ensemble de criteres. Ces criteres ont été identifiés et les

alternatives d'assurance privée et publique ont été comparées quant à leurs capacités de satisfaire à ces critères. Sur la base des résultats empiriques en évidence et des réflexions auxquelles elles donnent raison, ce rapport démontre que le choix entre l'assurance publique et privée englobe des conséquences importantes pour le taux d'accidents dans l'avenir. La considération de tous les facteurs identifiés qui ont un effet sur l'efficacité des programmes de récompenses pour la bonne conduite automobile, et ainsi sur la réduction des accidents, amène à la conclusion que l'intérêt de la sécurité routière en Ontario sera mieux servi si la responsabilité pour l'assurance automobile est déléguée au secteur public.

1. INTRODUCTION

Some time ago, professional drivers of a large fleet of trucks and vans employed by a food-producing company were promised a salary bonus of a few hundred dollars for each year in which they did not cause a traffic accident. The accident rate per driver, as well as the accident costs per kilometre driven, dropped drastically in immediate response to the announcement of this safety incentive, and several years later both levelled off to about one-seventh of what they had been before the institution of the incentive program.

The purpose of the present report is essentially two-fold. The first purpose is to call attention to what appears to be the most effective strategy toward accident prevention by describing the sizeable reduction in the number and costs of traffic accidents that may be expected from those intervention programs that take the form of extending rewards to automobile drivers conditional upon the fact of not incurring accidents in which they are judged to be at fault.

The second purpose is to contrast both the degree of feasibility and the extent of the potential safety impact of launching such incentive programs under two different conditions: when automobile insurance is under public management and when it is offered by the private sector.³⁷ It will be seen that the differences in the to-be-expected reductions of the traffic accident problem are likely to be substantial. In this comparison, issues other than road safety promotion will not be considered.

The societal importance of reducing the traffic accident problem is immense indeed, as may be illustrated as follows. It can be calculated that in the year 1985 the economic costs of road accidents in Ontario amounted to some \$1.2 billion, or \$131 (Canadian) per head of population, meaning all men, women and children living in our province, and not just drivers.¹⁻² Traffic accidents are among the leading causes of death in Ontario and are even the most prominent one in certain age groups.³ In contrast to cardiovascular disease and cancer (the dominant causes of death in the population as a whole), road accidents kill people at a relatively young age. It has been estimated that in Canada, road deaths account for 1.7 times more potential years of life lost than is true for

cancer and 1.2 times more than due to cardiovascular disease.⁴⁻⁶

It should be recognized, too, that in addition to carrying this burden of material loss and human suffering, our province spends large resources on road safety management in various forms, ranging from driver education, licensing and record keeping to traffic law enforcement, court operations and jailing, road construction and maintenance, intersection signalization and railway-crossing level separation. The total cost of road safety management to the province is probably unknown, but it certainly is substantial.

Against this background, it readily becomes obvious that any proposed change in operation that has a potential impact upon the traffic accident loss in our province deserves to be carefully studied with regard to its likely repercussions on safety. The current political debate in Ontario about the merits and disadvantages of private versus public automobile insurance entails a possible change in operation that may have a major impact upon traffic safety. So far, however, the traffic safety issue has not been a salient topic in this debate; that it deserves to be is emphasized here.

The present report is structured as follows. The empirically evaluated effects of various past incentive programmes upon traffic safety have been summarized in Section 2. This section also contains a short review of what may be learned for the purpose of traffic safety promotion from the documented experience with analogous programmes in industrial settings. From the combined evidence, a set of requirements for the design of effective incentive schemes is derived in Section 3. Potential sources for incentives are discussed in Section 4 and compared under the conditions of private versus public responsibility for automobile insurance. Section 5 evaluates the comparative opportunities for effective safety promotion under these two conditions against the yardsticks specified in Section 3. Finally, Section 6 contains the conclusions that can be drawn from the evidence and considerations presented.

1.1 A Note on Terminology

In order to avoid long-winded phrases which might be more precise, we will, in this report, take some terminological shortcuts. Unless otherwise specified, accident cost refers to the sum total of accidents occurring in a jurisdiction as a whole or in a sub-group of road users in particular, while each accident (fatal, personal injury or property damage) is weighted according to its severity. The sum total of accident cost, when calculated per calendar year and divided by the number of residents, yields a per capita accident rate. This accident rate is different from the accident rate per kilometre of mobility and should be clearly distinguished from it.⁷

The term 'incentive for safe driving' refers to a gratification or bonus extended to drivers on the condition that they do not have an accident, in which they are at fault, within a specified time period (like six months or one year). 'Incentive' is different from 'reward' or 'reinforcement' in that drivers are fully informed in advance of the requirements they have to fulfill in order to become eligible for its realization at some specified time in the future. In contrast, a 'reward' is something that may come unexpectedly. An incentive is intended to stimulate people to achieve a particular performance, while its realization into a bonus should satisfy a need or desire.

Note that, in order to be eligible for the bonus, the driver should be free of accidents in which he or she is culpable, and not just display some specific safe behaviour (like wearing a seat belt). Similarly, disincentives mentioned in this report are penalties contingent upon the fact of incurring an accident in which the driver, to whom the disincentives apply, is found to be at fault. Unsafe driver acts or violations of the highway code will not be considered if they are not followed by an accident.⁸ As incentives for not having a 'culpable' accident and disincentives for having one both constitute inducements towards safety, we will use the term 'incentive' to cover both, unless otherwise specified.⁹

2. PAST EXPERIENCE WITH INCENTIVE PROGRAMMES

In this section we will summarize the findings of various studies which examined the effect of extending

incentives for safety upon subsequent accident frequency. This approach towards accident prevention differs basically from the 'traditional' emphasis upon training, enforcement and engineering, because it attempts to enhance drivers' desire to be safe, rather than merely providing them with more opportunity to be so, or discouraging them from specific unsafe acts. Moreover, it will be seen that incentives for safe operation of equipment by employees in industry have led to substantial reductions in occupational accident rates.

2.1 Incentives for Safe Driving

A well-controlled field trial, in which the expected cost of being at fault in an accident was increased, resulted in a marked reduction in the accident rate of the driver population involved.¹⁰ Members of military personnel at a U.S. airforce base in Texas were informed that their ranks were in jeopardy and that they even ran the risk of dishonorable discharge from the service if they were found to be at fault in an accident. Referral to a psychiatrist was another unpleasant possible consequence. These measures were put into effect for one year and the results were compared with the accident rate before the measures were instituted as well as with the accident rates of military personnel at other bases (without the program) and with general trends. The authors concluded that the number of accidents of personnel at the experimental base diminished by 50%, the total frequency of personal injuries by 54% and of personal injury to the driver by 60%.

The very act of engaging in the risky act of driving (rather than being at fault in an accident) was economically discouraged in another case.¹¹ As a consequence of the elimination of Connecticut state subsidies for driver education in high schools, nine school boards decided to drop the courses from the curriculum, while others continued to offer them. Obtaining a driver's licence thus became more difficult and more expensive. Subsequently, the total number of licensed years of 16- and 17-year olds diminished by 57% in the communities without high school driver education, as compared with 9% in communities where this education was retained.¹² Due to the reduction in driving, the former communities showed a 63% decrease in the traffic accident rate of 16- and 17-year olds, while

there was no change in this respect in the other communities.

In the mid-1970s an innovative and relatively large-scale experiment was conducted in California.¹³ The Division of Highways in that state contacted 9,971 drivers who had caused collisions or committed violations in the previous year and thus had incurred recent demerit points. These drivers were informed by letter that they would receive a free 12-month extension to the validity of their driver's licences on the condition that they achieve a clean record during the forthcoming year. Apart from the financial incentive, amounting to a few dollars per year, this offer also implied deferral of the obligation to again submit themselves to the the written part of the driver's examination, which in California is administered repeatedly throughout a driver's career.

A control sample of another 9,976 drivers was not approached in this manner, but they too were followed up along with the experimental group over a period of several years. The findings include the following. In the first follow-up year, there were significantly fewer accident-involved drivers in the experimental group, particularly among the younger drivers¹⁴ and among those drivers whose licence renewal was to come up within one year after receipt of the letter.¹⁵ In this latter group, the accident rate was 22% lower than in the appropriate controls. The drivers who actually earned the bonus after one year showed 33% fewer accidents in the second follow-up year than did the controls.¹⁶

More recently, a report was published about an ongoing incentive project in West Germany that has not, as yet, received the amount of attention of the road safety community that it deserves. This project has already been hinted at in the Introduction above. Professional drivers employed by the German branch of Kraft Foods Corporation, with a fleet of about 600 trucks and vans, were told in 1957 that they would receive a bonus of about \$175 (Canadian) for every half year of driving without "culpable accidents" (i.e., without accidents in which they were judged to be at fault).¹⁷ This incentive programme is currently still in force.

In the first year after the initiation of this incentive scheme, the frequency of culpable accidents per

100,000 km driven fell abruptly by about one-third, and subsequently continued to drop more smoothly; in 1981, the accident rate per km amounted to about 14% of what it had been in 1956 (i.e., prior to the programme). The rate of all accidents - culpable or not - fell to 25% of what it had been before in 1956. The direct financial accident costs per km driven showed a steeper decline than the accident frequency per km driven.⁵¹ This indicates that the incentive programme was particularly effective in reducing the occurrence of more serious accidents. The total implementation costs of the programme are estimated at about \$40,000 (1983 Canadian dollars) per annum, but these costs are reported to be outweighed by far by the reduction in insurance fees resulting from the much improved safety record.¹⁸

2.2 Incentives for Safety in Industrial Settings

Occupational accidents are very costly to manufacturing, mining, construction and other industries, not only because of lost production time of employees and equipment, but also because of their consequences for payments to Workers' Compensation Boards and other forms of insurance. Insurance fees often depend on safety performance. As a result, efforts to reduce industrial accidents through monetary and material incentives to employees for accident-free operation have indeed become quite popular in North America,¹⁹⁻²³ as well as in other parts of the world.²⁴⁻²⁵ It would, therefore, seem worthwhile to investigate what, if anything, may be gleaned from the documented industrial experience with a view to applying it to road safety promotion. The terrain is different, but the same principles may well apply. Thus, what follows is a short interpretive review of what can be learned from various publications on the effect of safety incentives that have been implemented and evaluated on their effect in industrial settings.

Incentive systems tend to be more effective if employees are told how (i.e., through what specific behaviours) accidents can be avoided. As the California experiment¹³ indicates, this does not mean that incentives will not work if this educational component is missing, but in industrial settings it has been found to be helpful.

A very important factor in the success or failure of an incentive scheme is its perceived equity. Is the bonus seen as a just compensation for what one has to do, or refrain from doing, in order to receive it?

Is the bonus perceived as realistically attainable or is it seen as virtually beyond reach? The question becomes particularly important when lotteries are used, as is common in industry in various countries, and highly relevant to the traffic safety problem. This is because in any given year about 90% of licensed drivers are accident-free and thus would be eligible for their small share of the total incentive funds. One could alter that by rewarding, by lot, only 10 or 5% of accident-free drivers and give them a 10 or 20 times larger bonus. Although, on the one hand, this would appreciably augment the potential gains to be made by an individual driver, it might on the other hand lead some people to feel that their chances of obtaining the reward are so small that they may choose to ignore the incentive program and the change in road conduct the program is intended to inspire.²⁴

Any incentive programme should be developed in consultation and co-operation with those to whom it will be applied. The need for this is obvious from the points already made. For the same reasons, people should be clearly informed as to how it operates.

The incentive should materialize after a relatively short time period, for instance twice a year (periods as short as one month have been used in industry).¹⁹⁻²³ It may be recalled that in the California experiment cited in Section 2.1, a greater reduction in the accident rate was found in people whose licences were coming up for renewal relatively soon after they had been informed of the existence of the incentive.

Mention should be made here of the distinction between group and individual bonuses for not having any or at least a lesser frequency of accidents. One leading authority²⁴ feels that if incentives are applied in a competitive fashion to groups of people in industry (e.g., work teams) everybody in the winning group should benefit, including those group members who have had accidents. This is seen as more equitable, because "nobody really wishes to have an accident". However, it should be emphasized that driving, unlike much industrial work, does not con-

stitute team work in the usual sense of the word and that drivers actively and knowingly create situations - or more passively allow situations to occur - in which accidents are more likely. On the other hand, there is evidence that group bonuses strengthen the competitive motivation toward winning the award.

The institution of an incentive plan may lead to under-reporting of accidents, but this phenomenon appears to be limited to minor accidents only and so far constitutes the only documented undesirable side-effect of such schemes.

Many companies report that the savings accruing from the incentive systems are much greater than the monies spent on bonuses. The lowest reported ratio (savings divided by costs) is in the order of two to one.²⁶ In terms of the lost-day case rate, or doctors' cases, the magnitude of reductions attributed by different companies to their incentive schemes usually varies between 50 and 80% of the base rate. In other words, the rate of doctors' cases and lost days declines to one-half to one-fifth of what it had been before the incentive schemes came into effect.²⁷

A very recent publication on incentive programmes that have been in effect for 11-12 years in two American mining companies, shows reductions to as little as one-ninth to one-fiftieth of the pre-incentive yearly numbers of days lost from work per million hours of work because of work-related injuries.⁵¹

2.3 Why Is It That Incentives Work?

There can be no question that incentives for safety are powerful means for reducing the accident rate, both per unit distance of mobility (per km driven), per unit of productivity (as in industry) and per person. In fact, the effectiveness of incentives appears to be much stronger than that of traffic accident countermeasures in the more traditional categories: education, enforcement and engineering. What could possibly explain this situation?

Any driver's manner of driving and his or her amount of mobility carries a degree of accident risk. The less prudent his/her manner of driving and the more he/she drives, the greater the risk of accident in a given time period, say, one year.

However, such behaviour also brings expected benefits: greater speed, less time loss, more thrill, less boredom, a greater distance of travel per year, more opportunity to visit far-away places, more commercially productive kilometres and so forth.

Drivers, therefore, accept some accident risk in return for these gains. As 'economic animals', they try to operate their vehicles at a level of accident risk such that they feel that the net benefit will be maximal (all gains and losses, including possible accident loss, being considered).

This is their preferred level of risk, and it depends on many factors: financial, cultural, gender, age, marital status, peer group pressure and personality traits, as well as transient states such as preoccupations, fatigue, blood-alcohol level and being in a rush. This list is far from complete, but the various factors influencing the preferred level of accident risk can be conveniently categorized into four general groups:

1. the expected advantages of risky behaviours;
2. the expected disadvantages of cautious behaviours;
3. the expected advantages of cautious behaviours;
and
4. the expected disadvantages of risky behaviours.²⁸

The preferred level of accident risk, and thus the accident rate, increases with increments in Factors 1 and 2, and decreases with increments in Factors 3 and 4. It follows that any intervention that leads to a decrease in Factors 1 and 2 should reduce the preferred level of risk and thus lead to accident reduction. The same holds for safety measures that enhance Factors 3 and 4.

This is precisely what incentives for not having an accident and disincentives for incurring one do. They stimulate the desire for safety in the driver population. Consequently, effective safety management largely depends upon a jurisdiction's ability to effectively control the preferred level of accident risk of its inhabitants.²⁹

In contrast to safety promotion efforts through education, enforcement and engineering, economic interventions do not only appear to be more potent,²⁷ but their implementation is also relatively simple and cheap. Furthermore, it would seem much easier to stimulate people's motivation for safety through economic inducements than it is by attempts to directly influence the cultural and social values or personality traits that have a bearing upon the level of risk they prefer.

3. REQUIREMENTS FOR EFFECTIVE INCENTIVE PROGRAMMES

To serve the first objective of this report - to identify countermeasures that are effective - we have found evidence in Section 2 that incentive systems can achieve very significant gains in safety. However, past experience shows that some incentive programmes were more effective than others. The distinctive features of the more successful schemes will be specified in the present section. A checklist of desirable program characteristics is thus developed. This will serve as a frame of reference, as a set of yardsticks, which is needed to effectively deal with the second issue posed in this paper: an evaluation of the comparative opportunities for implementing effective safety incentives under private and public management of automobile insurance (which will be discussed in Section 5).

What follows is a list of specific requirements for effective incentive programming.

3.1 The incentives should widen the utility gap drivers perceive between causing an accident and not causing an accident by as much as possible.³⁰ Thus, the safety programme can be expected to become more successful as the difference becomes greater between the advantage of not having an accident on the one hand and the disadvantage of having one.

3.2 The introduction and long-term maintenance of incentive programmes should be conducted with vigour, commitment and coherence.

3.3 The incentive system should be perceived as equitable by those to whom it is addressed. Does the driving public view the bonus as a just reward for not causing an accident in a given time period? In the case of disincentives, does the driving public view the penalty imposed (e.g., an insurance fee surcharge) as justified?

3.4 The incentive scheme should be developed in consultation with those (or with representatives of those) to whom it will be applied.

3.5 Programmes should be designed such that incentives are viewed by drivers as realistically attainable and thus not beyond reach.²⁴

3.6 Incentive plans should be designed in a manner such that they strengthen peer pressure towards achieving the objective of no accident.³¹ Thus, the plan should not only stimulate each driver's concern for his or her own accident-free record, but also motivate her or him to influence peers so that their accident likelihood is also reduced.

3.7 The time periods at the end of which incentives materialize into rewards and disincentives into penalties should be relatively short (say, one year at the longest).³²

3.8 The amount of the incentive should grow as the individual driver accumulates a larger number of accident-free years. Incentive increments should follow a step-wise function that maximizes the driver's motivation to have no accident.³³⁻³⁴

3.9 The operational rules of an incentive system should be kept simple so that they can be communicated clearly to all persons to whom the programme applies.³⁵

3.10 Other things being equal, preference should be given to that incentive programme that is the easiest - the least costly - to administer.

3.11 Thought should be given to the question of how to counteract any problems that may arise from drivers under-reporting the accidents they have. This is important for a number of reasons. First, accident statistics may be in serious error as it has been estimated that a large proportion of all reportable crashes may in fact be unknown to the police and thus are not accounted for in the official accident statistics. Estimates of all property damage accidents accounted for in official records vary between 25 and 86%. Corresponding estimates for personal injury accidents depend on the type (pedestrian, cyclist, driver) and age of injured road user³⁶ and vary between 25 and 93%. Secondly, erroneous impressions of countermeasure effectiveness may result if there are changes in police investigation practices, or if the driving public alters - as a consequence of some intervention - its inclination to report accidents to the authorities or private insurance companies. A more detailed discussion of this issue and references are presented elsewhere.³³

3.12 Like any other accident countermeasure, an incentive plan should not be introduced without prior research into its short-term and long-term feasibility, nor without prior research into its best possible form, nor finally without provision for scientifically adequate evaluation of its costs and of its effectiveness in reducing the accident rate.

4. POTENTIAL SOURCES OF INCENTIVE PROGRAMMES IN THE PUBLIC SECTOR

In this section we will discuss various possible sources of incentives for safe driving in the general population which may be instituted through government action. Some of these have already been mentioned in previous sections, while other potential sources are added in a more speculative vein. In accordance with the Commissioner's requisition regarding the contents of the present report,³⁷ these possible sources are presented, first, under the assumption of privately run automobile insurance and, second, under the condition of public insurance management.

4.1 When Automobile Insurance Is In Private Hands

Following the California example,¹³ the province may offer free driver's licence extension by one year for each year drivers are accident-free.^{38,39} In addition, and as a disincentive, the validity of a driver's licence may be shortened by one year as a penalty of each year in which the driver had one or more culpable accidents. Another way of using driver's licence renewal as a source of incentives/disincentives could consist of discounts and surcharges in the renewal fee.

Following the Connecticut example,¹¹ the province may abolish the funds that are used by Boards of Education for the provision of driver education in high schools. This, naturally, would be a one-time intervention, rather than an ongoing one.

Another opportunity for incentives is offered by reducing the charge for the annual validation stickers of vehicle permits. Thus, this incentive would be based on the 'culpable' accident experience of the vehicle (i.e., regardless of the identity of the driver(s) of the vehicle, but depending upon whether the driver was at fault) and be extended to the owner. Surcharges in annual permit fees may be used as an analogous disincentive.

Discounts and surcharges in the provincial portion of income tax paid by holders of driver's licences may be considered and justified on the grounds that the province's expenditures for medical treatment of people injured in accidents are carried by Ontario Health Insurance Plan (OHIP) and the cost of the health delivery systems greatly exceeds the sum total of OHIP fees.⁴¹

Reasoning in the same vein, a discount and/or surcharge in the OHIP fee payable may be considered for holders of a driver's licence as a function of their culpable accident experience.

Finally, the provincial government may attempt to exert pressure on the private automobile insurance companies towards installing incentive and disincentive schemes of their own.

Some of these bonus and penalty systems would obviously be more cumbersome to implement and administer than

others. Part of the administrative difficulties arises from the need for verification of driver and vehicle record accuracy and recency.⁴⁰

We will refrain from elaborating on the more precise procedural details of the above suggestions, and this for two reasons. First, each of these suggestions is in need of in-depth feasibility study in collaboration with officials in administrative domains in which the present author has no claim to expertise. Secondly, although there is reason to believe that the potential accident reducing effect of the above suggestions is sizeable enough to warrant serious consideration, this effect is likely to be relatively modest in comparison with what may be achieved in terms of accident prevention if automobile insurance is placed under public control (as will be seen in Section 5).

4.2 When Automobile Insurance Is Under Governmental Responsibility

If this condition prevails, all of the above-mentioned possibilities would, of course, still apply. They would, however, be joined by direct public control over a relatively simple to manage and most powerful source for effective safety programming. Why this is so will be discussed in the next section.

5. A COMPARISON OF OPPORTUNITIES FOR EFFECTIVE SAFETY PROMOTION UNDER PRIVATE VERSUS PUBLIC DELIVERY OF AUTOMOBILE INSURANCE

In Section 2 we arrived at the conclusion that those measures that take the form of enhancing drivers' desire for safety are the most promising interventions for the purpose of accident reduction. The best available method for stimulating this desire appears to be the extension of incentives for the successful avoidance of 'culpable' accidents and the imposition of penalties for incurring such accidents. Specific features that strengthen the effectiveness of this type of intervention have been outlined in Section 3. Subsequently, in Section 4, potential sources for incentive programmes have been pointed out under conditions of public versus private delivery of automobile insurance.

The task we seek to accomplish in the present section is to compare the opportunities for road safety promotion in Ontario under these two conditions. In doing so, the same sequence of criteria as presented in Section 3 will be followed. A quick overview of our observations is provided in Table 1.

5.1 Widening of the Utility Gap

As noted in Section 2.3, the traffic accident rate may be expected to drop to the degree that the driving population's desire for safety is enhanced. This desire will be greater to the extent that the difference between the advantage of not having an accident on the one hand, and the disadvantage of having an accident on the other, is widened.

TABLE 1: Comparative strengths of private and public insurance in terms of requirements for effective incentive programming.1)

REQUIREMENT	INSURANCE:	
	PRIVATE	PUBLIC
1. Widening of the utility gap	-	+
2. Managerial vigour and commitment	-	+
3. Perceived equity of incentives	-	+
4. Consultation with the driving public	-	+
5. Perceived attainability of bonuses	=	=
6. Enhancement of peer pressure towards safety	-	+
7. Short incubation periods for incentives	=	=
8. Continued accumulation of safety credits	=	=
9. Simplicity of rules and fee structure	+	-
10. Low cost of administration	-	+
11. Handling the underreporting problem	-	+
12. Research and development effort	-	+

1) - means weaker; + means stronger; = means no difference

In Section 4, various possible sources for incentives have been mentioned. Although in the absence of government-run automobile insurance, several such possibilities exist, their scope in terms of the size of the utility gap

is much smaller than is true for automobile insurance. This is simply due to the fact that automobile insurance fees are much larger than the annual cost of a driver's licence or a vehicle permit, and thus offer much more room for differential (dis)incentives extended to accident-free as compared to accident-involved drivers.

Consequently, insurance fee discounts and surcharges are the best available source for incentives and disincentives.

5.2 Managerial Vigour and Commitment

It has been emphasized repeatedly in the available literature that the effectiveness of incentive programmes aimed at accident reduction depends on the degree of managerial commitment to this cause.¹⁹⁻²⁵ Thus, drivers should not only be informed of the incentive programme in existence, but they should also frequently be reminded of it in novel and attention-catching ways. It is obvious as well that the effort of any agency - be it private or public - towards accident prevention depends on its commitment to the goal of per capita accident reduction. The likely prospect for managerial vigour towards accident reduction in private insurance industry and in government will be discussed in the two Subsections 5.2.1 and 5.2.2 below.

5.2.1 Commitment to Safety Promotion In Private Automobile Insurance Industry

Private insurance is naturally not in the business of accident prevention, but in enhancing the difference between the total amount of fees received on one hand and expenditures due to claim costs, claim adjustment costs and administration on the other. The larger this difference is, the greater the opportunity for making a profit.

A sudden drop in the accident rate (for instance, as the result of incentive programmes) would of course be welcome to the private insurance industry: relative to the fees already received, the cost of claims and claim adjustment would show a marked drop, and absolute profit would be greater.

It should be noted, however, that this welcome will by necessity be short-lived. This is because the amount of money people are willing to pay out in insurance depends upon the amount of risk they perceive. This, in turn, ultimately depends upon the risk there actually is.⁴²

While, as individual persons or as corporate citizens, people in the private insurance industry may have a genuine interest in promoting safety, one cannot expect a business to act against its direct commercial interests.

5.2.2 Commitment to Road Safety Promotion In Government Agencies

However, it is no less relevant to note that the absence of a strong concern for reducing the accident rate may also be reflected by many of the countermeasures taken by those governments that have no direct financial or political stake in actual accident reduction. This is because politicians may be tempted, for public relations reasons, to take measures whose main or exclusive merit consists in showing the electorate that something is being done about the safety problem.⁴³ Surely, democracy demands that safety is seen to be promoted, but whether it actually is promoted is another matter.

When recent history of road safety management in various countries or smaller jurisdictions is compared with other government concerns such as health care, it will unfortunately be seen that many governments have failed to develop coherent and vigorous strategies for traffic accident prevention. In part, this may well be due to the fact that responsibility for safety is usually divided across various ministries (such as for health, education, justice, transportation and internal affairs), while the very division of responsibility may reflect lack of governmental concern for the issue.

At any rate, this responsibility, like the 'proverbial buck', is often passed from one party to another and no concerted action emerges. For the sake of brevity, let one documented instance suffice to illustrate the point. An inter-ministerial road safety committee encompassing seven ministries in the Netherlands (with a population exceeding half of Canada's), each ministry having a share in the responsibility for road safety, took no less than

four years after its establishment by parliamentary decision to confer around the same table and to discuss and integrate the respective policies.⁴⁴

In this context it should be noted too that the general public's pressure towards greater safety is also generally wanting. Apart from occasional outcries vociferated by some citizens' groups in some jurisdictions against the ubiquitous presence of the automobile, against the safety threat posed by heavy trucks or by young or drunk drivers, there seems to be no strong and persistent demand for greater safety throughout the general population.

In fact, if it existed, people would not wait for government action, but simply resort to their own capabilities to reduce the accident rate by voluntarily changing their amount and manner of road use. In other words, people in any jurisdiction have the accident rate they are collectively willing to accept in return for the amount and manner of mobility they enjoy. Unless the desire for safety is somehow stimulated, people will exert only little pressure on their government to reduce the accident rate, and, in turn, the government is not likely to develop the political will that is necessary to take more substantial, than merely symbolic, measures towards accident reduction. It would seem fair to conclude that there is little ongoing governmental, corporate or public interest in reducing the traffic accident rate.

So, in order to break this 'vicious circle' - vicious from the safety promotion point of view - between people's complacency and lack of political will on the part of their elected representatives to reduce the accident rate, what can a government do?

Suppose we are dealing with a government that is fully aware of the tremendous costs (see Section 1) of traffic accidents to its jurisdiction. Suppose too that we are dealing with a government that wishes to play a leadership role in reducing the traffic accident rate, rather than remaining a mere follower of existing public attitudes and conduct. Suppose finally that this government would like to be a shining light, an exemplar, to governments of other jurisdictions, and to project its influence into the future (as earlier governments have achieved by many forms of social legislation).

In that case, the answer to what a government could do in order to reduce the traffic accident rate is very simple indeed: (a) assume public responsibility for automobile insurance, and (b) impose insurance fees according to each individual driver's past accident record. In doing so, a government would be able to achieve two things: it would "pull itself up by its own bootstraps" in becoming more concerned about safety promotion than before, and it would enhance the general public's desire for safety and thus strengthen public support for the governmental effort.

In addition, there is reason for expecting that the government's commitment to road safety promotion will increase with time if it were to assume responsibility for accident insurance. When claim costs rise from year to year as a consequence of continued inflation, there would seem to be three options for a government to cope with this: (a) impose higher insurance fees upon the electorate, (b) absorb the increased costs through other (tax) revenues, or (c) attempt to reduce the accident rate. As the first two alternatives are unlikely to be attractive to a government that wishes to stay in power, it will likely become more inclined to develop a stronger thrust in the pursuit of accident reduction.

To sum up so far what has been pointed out in this section: among the various possibilities, insurance premiums appear to be the most productive source for effective incentive programmes for safety, and the institution of government-run insurance for automobile accidents holds the promise of a much more determined management of traffic safety than can be expected under private insurance conditions.

The likelihood of fulfilment of the other conditions for effective incentive programming does of course depend on managerial commitment and the two conditions already dealt with would seem to have an overwhelming impact as compared with the others. Consequently, we can be brief in describing the comparative opportunities for the design of incentive schemes under private and public insurance conditions against the remaining criteria.

5.3 Perceived Equity of Incentives

Here again we see a point in favour of government-run insurance, because the democratic process, in the case of public dissatisfaction, provides for swifter and more effective influence upon members of government and/or parliament than on the practices of private businesses.

5.4 Consultation With the Driving Public

Once again, this criterion for effective safety programmes of the incentive/disincentive variety would seem to be best met if automobile insurance were to be placed under public control. This is because politicians and the civil service are more likely to pay attention to the will of the electorate.

5.5 Perceived Attainability of Bonuses

This of course depends on the precise ramifications of any incentive scheme, and in principle there would seem to be no reason to assume that private schemes would satisfy this criterion any more or less than public ones.

5.6 Enhancement of Peer Pressure Towards Safe Conduct

The effect of peer pressure or social pressure towards any individual's cautious behaviour on the roads depends among other things upon the number of peers or other people exerting the pressure.³¹ Maximum peer pressure would be more likely to occur under conditions of public automobile insurance, because the same rules would apply to each individual driver. In the case of private insurance, it could maximize too on condition that all private insurance companies operating in Ontario acted in concert.⁴⁶ However, as there are as many as 79 such companies, the likelihood of a fully concerted policy system is not all that great. Moreover, the more the private insurance companies would act in similar fashion, the more the competitive edge between individual companies would be progressively eliminated, and thus ultimately the very raison d'être of private insurance would disappear.

5.7 Short Incubation Periods For Incentives to Materialize

The general principle that applies here is: the shorter the incubation period, the greater the to-be-expected reduction in the accident rate. However, short incubation periods demand that drivers be frequently informed of the subsequent discount/surcharge status. This engenders administrative costs due to verification of record accuracy and recency, as well as the preparation and mailing of letters. Periods shorter than six months or even one year may, therefore, not be realistically attainable.

To provide for immediate feedback to drivers who are at fault in an accident, it is necessary that they be informed of the surcharge implications for their next insurance period as soon as is administratively possible after the occurrence of the accident.

Apart from the issue of managerial commitment discussed in Section 5.2, we see no reason for assuming that private and public insurance would differ in their ability to meet this requirement.

5.8 Opportunity For Continued Accumulation of Safety Credits

According to a 1982 paper on incentive schemes for accident-free driving, it would seem that the manner in which premiums are reduced for consecutive years of accident-free driving is not optimal from the point of view of effective behaviour shaping. In Ontario, for instance, the discounts in insurance fees do not become progressively greater with the continued accumulation of an accident-free record spanning more and more years. Absolute fee reductions actually diminish with the progression of time.³³ This is in conflict with the theories of human motivation that state that reward increments are necessary for maintaining effort towards performance goals of increasing difficulty.^{47,48} Moreover, in a jurisdiction such as Ontario, additional discounts are not extended beyond five years of accident-free driving. If a driver is at fault after this period has lapsed, a 'forgiveness clause' is in effect, which may save the driver from an increase in his/her insurance fee if he or she has an accident.⁴⁹ Approximately 49% of licensed drivers

have no accident in a 5-year period. The implication is that the potential for behaviour shaping through insurance fees is not being used in about one-half of the entire driver population and is poorly used in the other half.³⁴

This situation can, of course, be remedied.³³ Again, with the caveat regarding managerial commitment, we see no reason why private and public insurance would differ in their capability to bring this remedy about.

5.9 Simplicity of Rules and of Fee Structure

Here we meet with a requirement for effective incentive programming where private industry may possibly do better than government. This is because government regulations - reflecting the complexity of society, legal technicalities and various demands for equity - have a tendency to become progressively encumbered by so many clauses, exceptions and special considerations, that the regulations often reach a level of complexity that is well beyond the rapid understanding of the average citizen (including the present author when attempting to complete the income tax forms).

5.10 Ease and Low Cost of Administration

The province already has various administrative systems regarding driver's licence holders in place: driver licensing, vehicle registration, the demerit point system and the OHIP and related health delivery files.

Delegating the bookkeeping for automobile insurance and an incentive system to public authority would likely be much less costly than the sum total of administration costs carried by as many as 79 different companies presently in the business of private automobile insurance in Ontario.⁴⁶

Consequently, less of the total insurance cash flow would have to be spent on clerical effort and correspondingly, more would be available for effective safety programming.

5.11 Handling the Under-Reporting Problem

In order to make accident statistics reliable, it is not sufficient to rely on police or insurance records; hospital records have to be included in the data gathering process as well. The fact that these records already exist, and that they are part of government documentation in the form of OHIP health care delivery, is a point in favour of integrated government control over road safety management.

5.12 Meeting the Needs for Research and Development

In Section 2 it was shown that programmes, which provide incentives for accident-free driving and disincentives toward incurring an accident in which the driver is judged to be at fault, are capable of producing substantial reductions in the accident rate.

Nevertheless, with respect to the practical introduction of any such programme in a particular jurisdiction, several practical questions remain.⁵⁰ To name just a few: what are the comparative merits of allowing an accident-free driver to pay a reduced fee versus sending him or her a rebate at the end of the insurance period? What incentives and disincentives are viewed as equitable by the driving public? What extended bonuses are viewed as realistically attainable and what penalties are, indeed, possible to avoid? What incentive scheme is most likely to enhance peer pressure towards safe conduct in traffic? What is the optimal fee structure from the point of view of maximizing driver safety motivation in the short and long term, while actuarial considerations of accident probabilities are taken into account? What format of operational rules for incentives/disincentives is simple enough to be readily understood by those to whom it is addressed? How do drivers in fact alter their behaviour in response to an incentive system coming into effect? What are the implications for mobility and transport economics? Is the danger of under-reporting of minor accidents indeed the only discernable negative side-effect of incentive programmes?

It is obvious that the careful introduction and the evaluation of the effectiveness of incentive programmes requires the support of a considerable research and development effort. Thus, the question arises, under what

conditions of automobile insurance, private or public, do we have reason to believe that this research will indeed be carried out?

When past performance is taken as a basis for predicting future performance, there is little reason for confidence that the research will indeed be undertaken if automobile insurance remained in private hands.⁴² The considerations discussed in Sections 5.2.1 and 5.2.2 make it rather unlikely that in such circumstances the research will be conducted either by the private insurance industry, or indeed even by government. However, the viability of this research would be greatly enhanced if automobile insurance were to be placed under government responsibility, because the research would then be viewed as necessary towards the goal of maximally efficient accident reduction, a goal in which the government would then have a vital interest. As noted earlier in this report, the private automobile insurance industry cannot be expected to be interested in pursuing the goal of accident reduction with vigour and persistence.

6. CONCLUSIONS

In agreement with our mandate,³⁷ the focus of this report has been on traffic accident reduction. It has been discussed, first, what kind of accident countermeasures promise the greatest benefit for safety. These turn out to be those countermeasures that are successful in stimulating the driving public's desire for safety, and incentives for accident-free driving were found to be the most helpful toward this purpose.

Next, the required features of a maximally effective incentive plan have been identified and, using these as a frame of reference, we have attempted to evaluate the comparative opportunities for successful incentive programming under conditions of private and public automobile insurance. The results of this review are summarized in Table 1.

With respect to most criteria, the opportunities for effective safety programming would seem to be greater under public than private control over automobile insurance. These include the two criteria that carry the heaviest weight in this comparison: (a) widening 'the utility gap'

between a driver's benefit resulting from not having an accident and the disadvantage of having one, and (b) the strength of managerial commitment to safety promotion.

The other prerequisites which seem to have a better chance of being fulfilled when automobile insurance is managed by the public sector are: (c) the equity of the incentive system according to public opinion, (d) the necessary consultation between insurers and insurees on the particular operational rules of the incentive programme, (e) the enhancement of peer pressure towards safe conduct, (f) low cost of administration, (g) adequate handling of the accident under-reporting problem, and (h) discharging the responsibility for an appropriate research, development and programme-evaluation effort.

With respect to three yardstick for effective programming, we found no major differences in the prospective adequacy between private and public insurance. These are the needs to ensure (i) that the bonuses for safety are indeed being perceived as attainable, (j) that their incubation periods are relatively short, and (k) that drivers' entitlement to progressively greater insurance discounts in return for accident-free driving continues to grow over the span of many years.

It has been pointed out, however, that the equality of private and public insurance in meeting these particular requirements largely depends on the managerial effort of the private insurance industry towards the design, implementation and continued maintenance of effective incentive programmes. It has been pointed out, too, that a firm commitment of this industry to such an effort may be called into question, because safety promotion is not in the interest of private insurance and no business can be expected to act against its direct commercial concerns.

Finally, against one of the twelve identified yardsticks of successful incentive programming, privately-run insurance may be more satisfactory than may be expected to be true for insurance managed by the public sector, especially in the long run. This regards the requirement that the rules of any discount/surcharge system should be sufficiently simple to allow comprehensive as well as comprehensible communication to the driving public.

It would seem clear then that the documented evidence, the inferences following from it, and various other specified considerations must lead to the conclusion that the traffic safety interests of the jurisdiction of Ontario are likely to be better served if automobile insurance were to be placed under public control.

We have seen that it can make a great deal of difference to road safety, depending on whether automobile insurance is run in the private or in the public sector. So, what options for government action regarding the present issue of who should be in control of automobile insurance are open?

The first possibility is to "leave things as they are", but to do this implies that road safety authorities would miss out on a rare and major opportunity for reducing the road accident problem, as I hope to have convincingly demonstrated in this report.

The second possible course of action for government is to place automobile insurance under public sector management. In that case, the above-mentioned opportunity will not be missed, but will it be exploited to its full potential? As has been pointed out in this report, government-run insurance, although in most, is not superior in all respects relative to effective safety programming. Government insurance - because of the financial interest it implies - may be viewed as a necessary condition for vigorous and coherent management of the road safety problem, but is it also a sufficient condition?

A third possibility for government action is to leave automobile insurance to private business, while imposing either general guidelines or strict regulation on the industry with regard to scientifically sensible discounts and surcharges as a function of a driver's accident record. This option may be welcomed as a compromise, but it may by the same token compromise the purpose of safety promotion, because private business cannot be expected to wholeheartedly comply with regulations that run counter to its commercial interests.

It should be obvious from the evidence and considerations presented in this paper that the issue of road safety in Ontario (among other deliberations not discussed here) does indeed deserve a prominent position in the

process of arriving at a judicious choice between private and public insurance.

NOTES AND REFERENCES

1. This was calculated from the following information. The total amount of property damage in Ontario in 1985 has been estimated at CDN\$ 547,518,951 (Ontario Road Safety Annual Report, 1985, p. 8). In that year there were 1,191 persons killed in traffic and 109,169 injured and the estimated population was 9,066,000. The average cost of a fatality is estimated at CDN\$ 260,000 and the average cost of an injury CDN\$ 3,000. These costs are expressed in 1985 dollars and are based on information provided by J.J. Lawson, Chief, Evaluation & Data Systems, Road Safety Directorate, Transport Canada, Ottawa.
2. That the estimate of CDN\$ 131 per head of population may well be an underestimate is suggested by a report under the title "The Economic Cost to Society of Motor Vehicle Accidents" (U.S. Department of Transportation, National Highway Safety Administration, Report no. DOT HS 806 342, January 1983). This report considers costs due to property damage, lost productivity, medical treatment, insurance administration, legal and court operations, emergency services, coroner/medical examination and the administration of public assistance programmes. For the year 1980, the economic loss to society from motor vehicle accidents was estimated to have been US\$ 57.2 billion. If this is divided by 220 million (the population estimate in that year), one arrives at an estimate of US\$ 260 per head of population. In any effort to 'translate' this estimate to Ontario in 1985, one should consider the exchange rate, the rate of inflation as well as the fact that this U.S. estimate did not account for traffic delay costs due to accidents (op. cit., p. B-21).
3. Statistics Canada. Causes of death, Vital statistics, Vol. IV, 1985.
4. A person who dies in an accident at the age of 20 loses 40 more potential years of life than somebody who is accidentally killed at the age of 60.
5. Hauser, D.J. "Seat belts: is freedom of choice worth 800 deaths a year?" Canadian Medical Association Journal 110 (1974): 1418-1426.

6. See Wells, R. "The lost years on the road." Medical Journal of Australia (January 1972): 186-188.

7. This accident rate should be clearly distinguished from the accident rate using other denominators: per 100 million kilometres driven, per hour of road use, per total number of registered vehicles, per km of public road in the jurisdiction or whatever other denominator. This is because, depending upon the choice of denominator, different rates show radically different patterns. To illustrate the point: in Ontario the rate of fatal accidents per 100 million miles driven dropped from about 8.5 in 1955 (the first year for which these data are available) to about 4.5 in 1972 (the year before the oil embargo and the ensuing 'energy crisis'), while the fatal traffic accident rate per 100,000 inhabitants rose from about 20.5 to about 23 in the same period. Similarly in the U.S., the fatality rate per 100 million vehicle miles dropped from about 11.3 in 1943 to about 4.5 in 1972, while the rate of fatal accidents in traffic rose from about 20 per 100,000 population to about 27. In view of the marked from-year-to-year variability in the traffic death rates per capita, the above statistics regarding the annual traffic death rates per capita were calculated on the basis of the regression equation relating the traffic death rate to the sequence of calendar years. In contrast, the traffic death rate per 100 million miles driven shows a much smoother curve (see Wilde, G.J.S. "On the choice of denominator for the calculation of accident rates." in Risk in Transport /ed. by S. Yagar. - Waterloo, Ont.: Univ. of Waterloo Press, 1984, pp. 139-154).

Readers of this report may well be puzzled by the factual observation that a reduction in the accident rate per km driven over several decades has not been associated by a commensurate reduction in the road-user accident rate per capita. One possible explanation for this, however, is quite simple. Accident countermeasures that are effective in reducing the accident rate per km driven are generally those that allow drivers to move faster at the same accident risk per hour of exposure. As the introduction of a more crashworthy car or a more forgiving road does not influence the preferred level of risk (see Section 2.3) per se, drivers respond by driving faster and more kilometres. So, the exposure to accident risk per head of population is not diminished by such countermeasures, but it can be reduced by interventions that decrease the preferred level of risk in the population.

8. Other programmes, which take the form of extending a bonus for particular safe behaviours, such as wearing a seat belt, have generally produced substantial increases in the frequency of such behaviours, as may be concluded from the literature references listed below.

(a) Cope, J.G., Smith, G.A. and Grossnickle, W.F. "The effect of variable-rate cash incentives on safety belt use." Journal of Safety Research 17 (1986): 95-99.

(b) Geller, E.S. Motivating safety belt use with incentives: A critical review of the past and a look to the future. - Warrendale, Pennsylvania: Society for Automotive Engineers, 1984. - (SAE technical paper series; no. 840326).

(c) Geller, E.S., Davis, L., and Spicer, K. "Industry based incentives for promoting seat belt usage: Differential impact on white collar vs. blue collar employees." Journal of Organizational Behavior Management 5, (1983): 17-29.

(d) Geller, E.S., and Hahn, H.A. "Promoting safety belt use at industrial sites: An effective program for blue collar employees." Journal of Professional Psychology: Research and Practice 15 (1984): 553-564.

(e) Horne, T.D., and Terry, T. Seat belt sweepstakes - An incentive program. - Warrendale, Pennsylvania: Society of Automotive Engineers, 1983. - (SAE Technical paper series; no. 830474).

(f) Rudd, J.R., and Geller, E.S. "A university-based incentive program to increase safety belt use: Toward cost-effective institutionalization." Journal of Applied Behavior Analysis 18 (1985): 215-226.

(g) Spoonhour, K.A. "Company snap-it-up campaign achieves 90 percent belt use." Traffic Safety 81 (1981): 18-19, 31-32.

(h) Geller, E.S. et al. A Commitment/Incentive Program to Increase Safety Belt Use on a University Campus. - Washington, D.C.: U.S. Dept. of Transportation, National Highway Traffic Safety Administration, March 1987. - (Report no. DOT HS 807 110).

(i) Geller, E.S. et al. Long-Term Effects of Employer-Based Programs to Motivate Safety Belt Use. - Washington, D.C.: U.S. Dept. of Transportation, National Highway Traffic Safety Administration, Feb. 1987. - (Report no., DOT HS 807 111).

9. Although 'incentive' and 'disincentive' may be viewed as each other's mirror image, we do not wish to imply that they are equivalent in their accident-reducing effect. On the contrary, there is evidence in numerous sources to indicate that 'positive reinforcement' for desirable acts generally has a stronger and longer lasting modifying effect upon behaviour and is true for 'negative reinforcement' of undesirable acts. (See Note 33 for a review). In plain English: honey catches more flies than vinegar, and the carrot is more powerful than the stick.

10. Barmack, J.E., and Payne, P.E. "The Lackland accident countermeasure experiment." Highway Research Board Proceedings 40 (1961): 513-522.

11. Robertson, L.S. "Crash involvement of teenaged drivers when driver education is eliminated from high school." American Journal of Public Health 70 (1980): 599-603.

12. This means that for each 16- and 17-year-old resident, the amount of time was determined in which he/she was in the possession of a driver's licence during his/her 16th and 17th year. The sum total of this time aggregated across all 16- and 17-year-olds gives the 'licensed years'.

13. Harano, R., and Hubert, D.E. An evaluation of California's 'Good Driver' incentive program. Sacramento: California Dept. of Motor Vehicles, 1974. - (Report no. 6)

14. I.e., 25 years of age or less. This may be due to younger people - because of their lesser income - placing a higher value on the bonus and/or younger people being "less set in their ways" and thus having less difficulty in altering their driving habits.

15. This agrees with the general finding that under the prevailing contingency ("fixed interval reinforcement schedule"), response patterns are often weak and uneven in the early parts of the interval, but become vigorous towards the end (see Luthans, F., and Kreitner, R. Organizational Behavior Modification. - Glenview, Ill.: Scott, Foresman, 1974). The practical implication is that, in order to enhance performance, intervals should be short.

16. It should be noted that a parallel experiment, using unexpected and unconditional rewards instead of incentives (which by definition are announced in advance and conditional) led to increases in the accident rate of the drivers who received these unexpected rewards. The marked difference in results highlights the important distinction between 'reward' and 'incentive' programmes and shows that the latter should be prepared with great care.

17. Tschernitschek, E. "Verkehrssicherheitsprogramm eines Vertriebsunternehmens." Berufsgenossenschaft. (February 1978). Additional reports on this "Kraft-Fahr-Sicherheitsprogramm 1957-1982" were received from Dr. J. Labudde, Eschborn, West Germany, via Prof. Praxenthaler (Cologne) and Dr. K. Reiter (Essen).

18. Unfortunately, we are not dealing with a well-controlled experiment. The safety programme contained educational components in addition to the incentive. No control data from other companies without an incentive system are provided. However, the sheer size and the temporal pattern of the observed accident reduction leads one to believe that the incentives must have been the dominant effective factor.

19. Cohen, A., Smith, M.J., and Anger, W.K. "Self-protective measures against workplace hazards." Journal of Safety Research 11 (1979): 121-131.

20. Crapnell, S.G. "For prize-winning programs, try awards and incentives." Occupational Hazards 44 (1981): 35-40.

21. Czernek, A., and Clack, G. "Incentives for safety: how prizes for avoiding accidents foster safety awareness." Job Safety and Health 1 (1973): 7-11.

22. Lancianese, F.W. "Small plant's safety success formula." Occupational Hazards 43 (1981): 45-48.
23. Palisano, P. "Awards and incentives heighten workers' safety awareness." Occupational Hazards 43 (1981): 35-40.
24. Bartels, K. Über die Wirksamkeit von Arbeitssicherheitsprämien. - Dortmund, W. Germany, 1976. This is unquestionably one of the best available documents on the use and effect of incentive for safety in occupational settings.
25. Karasina, N.I. Psychological and material incentives for the improvement of workplace conditions. - Moscow: Scientific Research Institute for Occupational Safety, 1977. (In Russian). The open-minded reader of this monograph will notice that, despite the 'heavy-duty' (duty indeed!) ideological comments by the author, occupational safety problems and their effective treatment by means of incentives are not unique to jurisdictions characterized by free enterprise.
26. This means that a company can make money on its safety incentive programme! The cost of investment in safety improvement (i.e., payment of the bonuses) is in fact more than offset by reductions in the cost of insurance fees. This means that insurance organizations experience a cut in fee revenue. In other words, the added safety is achieved at the expense of fee income received by the insurance organizations. See Section 5.2.1.
27. The interested reader may well be surprised that the relatively modest bonuses for safe conduct on the road as well as in industry are apparently capable of producing major reductions in the accident rate. This is possibly due to the intrinsically interesting challenge posed by incentive schemes ("Can I achieve the safety criterion or not?"), plus the social recognition that comes with attaining the objective. Human conduct is replete with examples showing that behaviours that lead to or reflect economic success rapidly become the norm as to what is the proper thing to do. At any rate, the observation that minor benefits to safe conduct reduce the accident rate to a major extent is in general agreement with an observation made by Starr (Starr, C. "Social benefit versus technological risk. What is our society willing to pay for

safety?", Science, 165 (1969): 1232-1238). That author found evidence that in an unsafe activity (i.e., various kinds of mining) the accident rate (injuries per man-hour) was exponentially related to hourly wages: accidents rose with the third power of the financial benefit. Thus, augmenting the benefit accruing from safe behaviour by a small amount should reduce the accident rate by a comparatively large amount.

28. In passing, it may be noticed that the subjectively perceived cost of an accident may be different under 'fault' versus 'no-fault' insurance. If no-fault insurance is interpreted by drivers as 'no blame' or in any other way reduces the expected seriousness of accident consequences, then an increase in the accident rate must be anticipated from a change-over from 'fault' to 'no-fault' insurance. This view is apparently not shared by O'Connell who wrote: "Nor need we fear that an increase in victims' faulty conduct will result from paying faulty and faultless accident victims alike." (In O'Connell, J. "Tort versus no-fault: Compensation and injury prevention." Accident Analysis and Prevention 19 (1987): p. 70). However, close reading of this paper reveals that O'Connell himself is not positively confident of that statement and that he favours no-fault insurance primarily for reasons other than safety considerations. Moreover, O'Connell's statement appears to be contradicted by the increase in accidents that followed the introduction of no-fault insurance for corporal damages (injuries and fatalities) in the Province of Quebec in March 1978, but it should be noted that the new law encompassed other elements as well. At any rate, it has been calculated that accidents with property damage only increased by 11%, those with personal injury by 26.3% and fatalities by 6.8%. It is of interest too that the author noted that while the "centralized compensation system [.....] generally increased greatly the speed, frequency, and size of compensations", it also probably led to a condition "that would lower the incentive to drive safely", and that "lowered the average quality and motivation to safety of the stock of drivers because of the sudden subsidy given to relatively risky drivers and the suppression of the notion of fault for all drivers". (See Gaudry, M. Measuring the Effects of the 1978 Quebec Automobile Insurance Act with the DRAG model. - Quebec: Centre de Recherche sur les Transports, Université de Montréal, 1986, p. 9).

29. Theoretical and empirical reasons for this statement are explained more fully in the following publications by the present author:

(a) "Social interaction patterns in driver behavior: An introductory review." Human Factors 18 (1976): 477-492.

(b) "The theory of risk homeostasis: Implications for safety and health." Risk Analysis 2 (1982): 209-225.

(c) "Critical issues in risk homeostasis theory: A reply." Risk Analysis 2 (1982): 249-258.

(d) "Beyond the concept of risk homeostasis: Suggestions for research and application towards the prevention of accidents and lifestyle-related diseases." Accident Analysis and Prevention 18 (1986): 377-401.

(e) "Risk homeostasis theory and traffic accidents: Propositions, deductions and discussion of recent commentaries." Ergonomics (1987) (in press).

30. The terms 'causing an accident' and 'not causing an accident' are meant here to be equivalent to being held legally responsible (wholly or in part) for an accident. In principle, incentive and disincentive programmes should also be capable of reducing the rate of non-culpable accidents, because by adopting a 'defensive' driving style drivers have the ability to reduce the likelihood of accidents in which they would not be at fault. For instance, it has been observed that drivers who have been drinking are not only more likely to get involved in culpable accidents than sober drivers, but they also incur more accidents in which they are not at fault [see e.g., Perrine, M.W., Waller, J.A., and Harris, L.S. Alcohol and Highway Safety: Behavioural and Medical Aspects. - Springfield, Virginia: National Technical Information Service, 1971. - (National Highway Traffic Safety Administration, Technical report no., DOT-HS-800-599)].

Although drivers can reduce the likelihood of getting involved in accidents in which they would not be deemed to be at fault, it would probably run counter to public concepts of equity if these drivers were to receive a penalty for such accidents. The same holds for withholding the reward for safe driving from those drivers who did have an accident, but in which they were not deemed to be at

fault. It is, therefore, reasonable to assume that bonuses and penalties will apply according to the table below.

	<u>Accident: at fault</u>	<u>Accident: not at fault</u>	<u>No Accident</u>
Reward applies	(a) no	(b) yes	(c) yes
Penalty applies	(d) yes	(e) no	(f) no

31. An effort to incorporate a programme component aimed at strong enhancement of peer pressure toward traffic safety, especially among young drivers, was made some time ago in an experimental incentive programme designed to be carried out in Saskatchewan (but that has not been implemented as yet). All holders of a driver's licence in separate age groups (e.g., the 16- and 17-year-olds, the 18- and 19-year-olds) residing in selected communities in the province would be informed that the Saskatchewan government insurance expects to pay out, for instance, \$3 million in claims to individuals in the given age group in that community in the course of the subsequent year. To this information it would be added that "any cent you can save will be divided among those of you who have no accidents in which you are responsible."

Thus, we are dealing here with a program in which the accident-free individual receives the bonus, but it may be anticipated that peer pressure towards safety will be accentuated. This is because the size of the bonus would not only depend upon one's own performance, but also upon the performance of one's age group as a whole. So, individual drivers would be made more interested not only in his or her own safety, but also be more concerned that their peers have no accident. This amounts to adding a material incentive to the cultural behest that people "behave as their brother's or sister's keeper."

Note that this programme is essentially free of financial risk to the insurer (i.e., Saskatchewan Government Insurance and Highway Traffic Board. A Strategic plan for research into young driver loss reductions. - Regina, February 1982), because no money would be paid out in bonuses in addition to what would be saved through fewer claims. (Saskatchewan Government Insurance and Highway Traffic Board. A strategic plan for research into young driver loss reductions. Regina, February 1982).

32. It would seem that delayed rewards/penalties are discounted, and thus less effective in shaping behaviour than more immediate consequences. It may be recalled that in the cited California experiment (Note 13) those drivers whose licences were coming up for renewal within one year after being informed of the existence of the incentive showed a greater reduction in accident rate than was true for people for whom licence renewal did not become relevant until two or three years later.

33. Murdoch, P.A., and Wilde, G.J.S. Reward and punishment in driver control. - Toronto: Research and Development Division, Ministry of Transportation and Communications, 1980.

34. Wilde, G.J.S., and Murdoch, P.A. "Incentive systems for accident-free and violation-free driving in the general population." Ergonomics 25 (1982): 879-890.

35. For illustrative purposes, the reader is referred to Exhibit A. It contains an easily understandable display of rules (although these rules may not be optimal against other criteria; see e.g., Section 5.8 and the other requirements mentioned in Section 5). This discount/surcharge system is currently in use in West Germany. The 'basic fee' is represented as 100% and the surcharges and discounts are charted as a function of the number of accidents incurred in any given year (on the left) and of the number of accident-free years (on the right). Beginner drivers enter at "Level zero" and pay 175% of the base fee; after one-half year of accident-free driving, their fee is adjusted downward to "Level 1/2", i.e., 125%, et cetera.

In the second part of Exhibit A, the consequences of making one or two claims in a given year for the insurance fee that will apply in the subsequent year are tabulated separately for drivers who prior to those claims belonged to various specified levels. So, a driver who has one claim after 7 years of claim-free driving will in the next year have to pay the fee that pertains to Level 3. Note that beyond Level 9 no further discounts are granted, but that it nevertheless continues to be advantageous for the driver to accumulate additional claim-free years. This is because a Level 12 driver, for instance, if he or she has one claim, moves to Level 8, while a Level 11 driver with one claim would move to Level 7.

36. Studies have shown that as many as 34% of traffic casualties treated in hospitals in the city of Rotterdam, the Netherlands, and 75% of child-pedestrian casualties taken to hospitals in Copenhagen, Denmark, were not known to the police. Unreported injury accidents in traffic were proportionally more common in pedestrians, cyclists and moped riders than was true for drivers and underreporting was found to be especially frequent for injured young pedestrians (Kolkman, H.J. "Strategy and tactics in matters of road safety." Paper presented at the conference of the International Federation of Pedestrian Associations, Geilo, Norway, June 24-25, 1976).

37. I.e., to include "the design of an incentive program, or programs, workable in a public sector delivery system, given that the insurance function remained in the private sector", and to contrast this with, "In the alternative, the design of an incentive program workable were the government to take over the delivery of automobile insurance" (letter dated 1987.04.08 from Ms Saskia Oltheten, Econometric Consultant to the "Inquiry Into Motor Vehicle Accident Compensation in Ontario" to the present author).

38. In fact, initial steps towards such a scheme, to be conducted under experimental conditions in Ontario, were taken in 1980 (see the correspondence between Ms Jan Pierce, Ministry of Transportation and Communications, Policy Planning and Research Division, Human and Social Systems, to the present author, dated 1980.08.11).

39. Several years ago, cost-benefit estimates for such a scheme in Ontario have been calculated. Depending on the various estimated average costs of reportable accidents, it was estimated that the safety benefits to the jurisdiction would exceed government's loss in licence-renewal fee revenues, if this countermeasure succeeded in reducing the accident rate in Ontario by as little as between 1.6 and 3.2%. (See pp. 76-80 in Note 33). Please observe that these necessary percentage reductions in accidents are much lower than what was actually achieved in the California experiment (see Section 2.1 and Note 13). In other words, cost-effectiveness of incentive programmes would seem relatively easy to accomplish. So, the reader may wonder why is it that the Ontario government has not acted accordingly, although it commissioned the report in question? For a possible answer, see Section 5.2.2.

40. Problems, relevant to the administration of incentive programmes, that arise from misclassification of drivers have been discussed by Harrington, D.M., and Ratz, M. The effectiveness of an at-home driver's licensing law test. - Sacramento: California Dept. of Motor Vehicles, 1978. Report no. 60. (Also see the reference in Note 13).

41. Ontario Ministry of Health. Annual Report, 1985/86, p. 46. Revenue from OHIP premiums amounted to CDN\$ 1,621,705,344 and total health care expenditure to CDN\$ 9,263,810,476.

42. This is another way of saying that the higher the accident rate, the greater the insurance industry's opportunity for absolute profit. Apart from a sudden and short-term drop in accidents, the insurance companies cannot rationally be expected to show a positive concern for the reduction of the accident rate. Dr. Patricia Waller (of the University of North Carolina Highway Safety Research Center) commented on "[....] incentives for insurance companies to offer incentives" at a recent highway safety conference in the U.S. She said: "The Insurance Institute for Highway Safety is a very notable exception, but on the whole, I haven't found the insurance industry terribly eager to do things in this area. I have heard it said, and I'm sure there are people here who know whether this is true and could clarify it, that insurance companies to a large extent make their income on cash flow, in which case it may not necessarily be in their best interest to reduce all these costs.[....] I haven't found the kind of response that I expected, and I have also heard that they may not be motivated to do anything to reduce costs". (in Human Behavior and Traffic Safety /ed. by L. Evans and R.C. Schwing. - New York: Plenum Press, 1985, p.380).

In this context, it is noteworthy too that - despite the common practice of allowing drivers premium discounts following specified periods of claim-free driving - to the best of our knowledge no published reports exist on experiments examining the safety consequences of insurance fee manipulation conducted by private insurers. This may be viewed as another symptom of their lack of concern for safety promotion. In passing we may note that the same lack of concern seems to hold for the automobile manufacturing/repair industry: the larger the number of cars 'totalled' in accidents or in need of new parts because of

less serious accidents, the greater the opportunity for profit and employment in that industry. "Thus, below the shiny surface of safety and safety promotion - like 'motherhood and applepie' superficially acclaimed by everyone - lurk the rocks of conflict and opposing interests" (Post-diploma Programmes in Occupational Safety and Occupational Hygiene Using Distance Education, Ergonomics course, Section 6, Subtopic 3.2, Humber College, Toronto, Ontario, 1987).

43. See Haight, F.A. "Road safety: A perspective and a new strategy." Journal of Safety Research 16 (1985): 91-98 and Wilde, G.J.S. "Gestion et stratégie de la sécurité routière: le point de vue d'un chercheur." Proceedings, Symposium sur la gestion de la sécurité routière au Québec, Montréal, Québec, janvier 1980.

44. Netherlands Parliamentary Proceedings. Debates 13-15, February 1979, Sessions 1978-1979, pp. 3371-3381, The Hague (in Dutch). However, if not satisfied by one example, the reader may be referred to more of these in Plowden, W. The Motor Car and Politics. - London, U.K.: The Bodley Head, 1971.

45. Although the perceived equity of such incentives would depend on their particulars, there is reason to believe that in principle they will be met by a very favourable response from the driving public. A sample of 613 holders of drivers' licences in Kingston and Ottawa, Ontario, were asked in February 1975 to mark their reaction to a wide variety of potential safety measures. One of these was the following proposition: "Establish a system of incentives and rewards for accident-free and violation-free driving (for instance free licence plate renewal for accident-free and violation-free driving in the previous year)". The answers were as follows:

strongly in favour	60%
mildly in favour	25%
undecided	6%
mildly opposed	5%
strongly opposed	4%

The degree of favourability expressed by individual drivers was found to show no significant association with annual mileage driven, manufacturing year of the car driven, driver's gender, age, age at which licence was first

obtained, education level, and a questionnaire for the assessment of personal concern for road safety. It may thus be concluded that public opinion is homogeneous in its support for the countermeasure in question. Unfortunately, no information exists as to why 9% of the respondents expressed opposition. (See Wilde G.J.S., O'Neill, B., and Cannon, D. Driver safety-mindedness and opinions of public policies for accident prevention. - Kingston, Ontario: Department of Psychology, Queen's University, 1975. - Studies of Safety in Transport; and Wilde, G.J.S. "A psychological study of drivers' concern for road safety and their opinions of various public policy measures against drinking and driving." Proceedings, Seventh International Conference on Alcohol, Drugs and Traffic Safety, Melbourne, 23-28 January, 1977, pp. 410-424).

46. The number 79 is arrived at if only those companies doing more than CDN\$ 1 million of premium writing in Ontario are considered. See Canadian Underwriter, Statistical Issue, May 1986, pp. 34-35.

47. Allport, G.W. "The ego in contemporary psychology." Psychological Review 50 (1943): 451-478.

48. Atkinson, J.W. "Some general implications of conceptual development in the study of achievement-oriented behavior." Human Motivation. - Lincoln: University of Nebraska Press, 1965.

49. From the point of view of a private insurer, this 'forgiveness clause' would seem to make very good sense. A driver with no accident in 5 years can be considered to be 'a good risk' and the insurer would not like to lose the insurance premium of this customer to the competition.

Insurance companies often give 'stars' (i.e., discounts) to beginner drivers if they have taken driver education prior to acquiring their licence. There is no evidence that such education, as we presently know it, actually produces drivers with fewer accidents (see Stock, J.R. et al. Evaluation of the Safe Performance Secondary School Driver Education Curriculum Demonstration Project: Final Report. - Columbus, Ohio: Battell Columbus Laboratories, 1983; Weaver, J.K. et al. Safe Performance Secondary School Driver Education Curriculum Demonstration

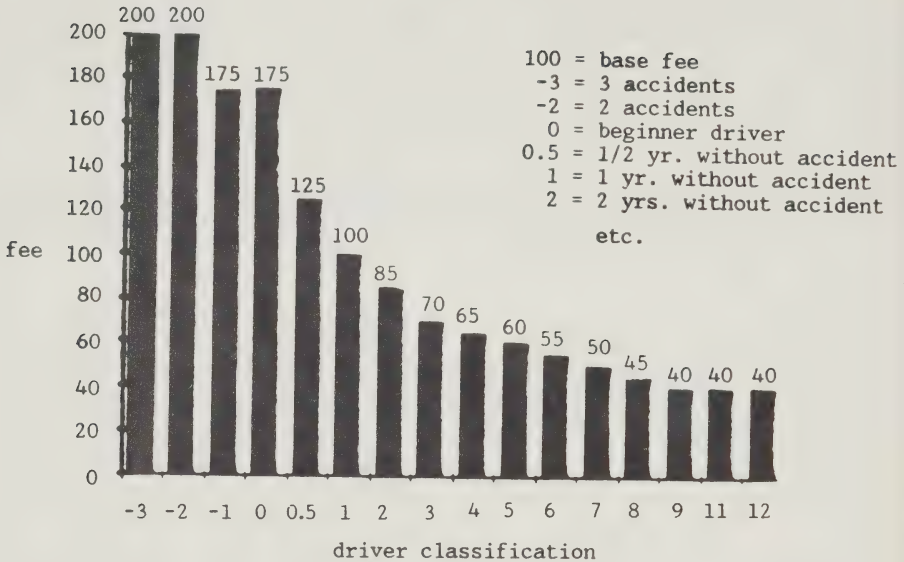
Project. - Springfield, Virginia: National Technical Information Service, 1981. DOT Report no.: DOT HS 806 192). Thus, the justification for the existence of this discount must be sought elsewhere (unless it resides in the belief that driver education makes for safer drivers). The offer of cheaper insurance may increase the inclination to drive (or parents' willingness to let their youngsters use the family car(s)) and thus potentially enlarges the total market of insurees, just as the number of young driver's licence holders has enhanced subsidies for driver education (see Section 2.1. and Note 11). Both factors increase the per capita accident rate.

50. See Young Drivers' Accidents: In Search of Solutions/ed. by D.R. Mayhew, H.M. Simpson and A.C. Donelson. - Ottawa, Ont.: Traffic Injury Research Foundation of Canada, 1985, pp. 82-85.

51. Fox, D.K., Hopkins, B.L., and Anger, W.K. "The long-term effects of a token economy on safety performance in open pit mining." Journal of Applied Behavior Analysis 20 (1987): 215-224. The term 'token economy' is psychological jargon for incentive programme. This paper strengthens the main list of earlier experience mentioned in this report: (a) despite initial skepticism regarding the effectiveness of incentive programmes, (b) actual effectiveness in reducing the accident rate per employee is very high, (c) very favourable benefit/cost ratios, (d) imaginative use of incentives that enhance peer (group) pressure toward accident-free conduct, (e) the need to counteract the inclination to under-report accidents when an incentive programme is in force, and (f) the fact that the incentives originally had the greatest reducing effect upon the more serious accidents and more gradually diminished the less serious ones (see the West German experiment mentioned in Section 2 and Note 17). In the paper by Fox, Hopkins et al., there is no indication whatsoever that the effectiveness of the incentive programme diminished over time. Clearly then, the favourable results cannot be attributed to the mere 'novelty' of the intervention or the so-called 'Hawthorne effect'. The calculated benefit/cost ratios of the programmes varied between 18 and 28 at one mine, and between 13 and 21 at the other.

EXHIBIT A: Example of a simple discount/surcharge scheme.
(See Note 35)

1. FEE STRUCTURE



2. DRIVER RECLASSIFICATION FOLLOWING CULPABLE ACCIDENTS

(a) From level: (b) If 1 claim, to level: (c) If 2 claims, to level:

13	9	4
12	8	3
11	7	3
10	6	3
9	4	2
8	3	1
7	3	1
6	3	1
5	3	1
4	2	1
3	1	1/2
2	1	1/2
1	1/2	-1
1/2	-1	-2
0	-1	-2
-1	-2	-3
-2	-3	-3
-3	-3	-3

APPENDICES TO VOLUME 1

APPENDIX I

LIST OF PERSONS WHO MADE ORAL AND WRITTEN SUBMISSIONS

LIST OF ORAL SUBMISSIONS

<u>NAME</u>	<u>HEARING LOCATION</u>
A & A CARTAGE	Toronto
- Aldred, Mr.	
ADVOCATES' SOCIETY	Toronto
- Webb, Peter	
- Rachlin, Ted	
AIRPORT TAXICAB ASSOCIATION	Toronto
- Butt, M.	
ALLARD, Edward	Toronto
ALLSTATE INSURANCE COMPANY	Toronto
- Groot, Steve	
- Roberts, J.	
ALTER, W.	Toronto
BAILEY, Dave	Kitchener
BATCHELOR, Dahn	Toronto
BEHAVIOURAL HEALTH INC.	Toronto
- Corey, Dr. David T.	
- Staub, Jane (Jane I. Staub & Associates)	
BELL, R. C.	Toronto
BINKS, Harry	Ottawa
BLACK, R.	Toronto
BONCA, Harry	Toronto
BRENNAN, Lloyd	Ottawa
BROKENSHIRE, John	Windsor
(President, Essex County Law Association)	
BUSH, Les	Thunder Bay
BUTTS, W. R.	Toronto
CANADIAN BAR ASSOCIATION	Toronto
- Bates, Timothy	
CANADIAN BAR ASSOCIATION - ONTARIO	Toronto
- Thomas, Bruce	
- Fiddler, John	
- Wilson, Janet	
CARLTON COUNTY LAW ASSOCIATION	Ottawa
- Cavanagh, Stephen	
- Parnega, Brian	
CARSON, John K.	Toronto
CASKIE, Jim	London
CAVILL, David	Windsor
CERISANO, Stanley	North Bay
CHARTERS, Dalton	Windsor
CHORNYJ, Greg	North Bay

CITIZENS FOR AUTOMOBILE INSURANCE REFORM	Windsor
- McBain, William	
CO-OPERATORS GENERAL INSURANCE COMPANY	Kitchener
- Scott, Wayne	
CRAIG, Eileen	London
DANDY, Burton	Toronto
DEAN, M. R.	Toronto
DOMINOTO, Connie	Windsor
DUNCAN INSURANCE SERVICES LIMITED	Thunder Bay
- Johnson, Fred B.	
ECONOMICAL MUTUAL INSURANCE COMPANY	Kitchener
- McConnell, Mike	
EISEL, Herman	Toronto
EVERGREEN REHABILITATION SERVICES	Toronto
- Lychenko, Robert	
- Freeman, Aaron	
FAIR (Fair Action in Insurance Reform)	
- McGrenere, Tom	Toronto
- Glass, Jesse	Toronto
- Pensa, Claude	Toronto
- Chapman, Bill	Windsor
FARRON, Chris	London
GILBERT, Gloria	London
GORE MUTUAL INSURANCE COMPANY	Kitchener
- LaPalme, Serge	
GORMAN, John (Nipissing Law Association)	North Bay
GRAY, Robert H.	North Bay
GREAVES, Glen	Toronto
GURAL, Melanie	Toronto
HAMILTON LAW ASSOCIATION	Toronto
- Nolan, Dermot	
HARMAN, Ted	Ottawa
HARPER, John	Kitchener
HARRISON, Blair	Ottawa
HAY, Mrs. I. H.	Toronto
HEAD INJURY ASSOCIATION OF LONDON & DISTRICT	London
- Austin, Guloo	
- Farron, Chris	
- Schaufelberger, W. K.	
HOBSON, Richard	Kitchener
HOUSER, Dana	Kitchener
INSURANCE BROKERS ASSOCIATION OF WATERLOO	Kitchener
- Philpott, Lorne	
INSURANCE BUREAU OF CANADA	Toronto
- Lyndon, Jack	
- Kennedy, Alex	
- Beatty, Gord	

- Miller, Ronald	
- Saunders, Harry	
- Finkelstein, Neil	
INSURERS INSURANCE BROKERS, THE	Toronto
- Wilson, Dave	
- Bray, Charles	
JAGT, Arnold	Toronto
JOHNSON, Gary	London
JOHNSON, Leonora	
JOHNSTON, Carman	Toronto
KATZ, Robert (Bob)	Toronto
KATZMAN, Marsha	Toronto
KINGSWAY GENERAL INSURANCE	Toronto
- Star, William (Bill)	
- Solloway, Jerry	
- Thompson, Murray	
KINRADE, Mr. M.	Toronto
KLEIN, Murray	Toronto
LAMONT, Rosemary	Toronto
LAVIGNE, Mary	Toronto
LEONARD, Mr. John	Toronto
LEVINTER, Mr. B.V.	Toronto
LEWINGTON, John	Kitchener
LINTON, Shirley	Windsor
LONDON CLAIMS ASSOCIATION	London
- Maurer, Peter	
LOS, Douglas	North Bay
MAD (Mothers Against Drunk Drivers)	Windsor
- Walsh, David, President	
- Lillian & Dean Pegg	
MAMOUDIAN, Fan	Toronto
MARINIER, Gilles	North Bay
McCABE, Al	Windsor
McCONNELL, Gregory E.	Toronto
McGLYNN	Kitchener
McKELLAR STRUCTURED SETTLEMENTS INC.	Kitchener
- McKellar, Frank	
McLEAN, Randy	Ottawa
MERSKEY, Dr. Harold	London
MIDDLESEX LAW ASSOCIATION	London
- Neilson, Murray	
- Williams, Dave	
MILLION, Barry	Toronto
MINISTRY OF TRANSPORTATION & COMMUNICATIONS	Toronto
- Wylie, Peter	
MITCHELL, John	Toronto
MITCHELL, Dr. W. M.	North Bay
MOTORCYCLE & MOPED INDUSTRY COUNCIL	Toronto
- Ramsay, Robert	

MURRAY, James	Toronto
NAGEL, Rudy	Toronto
NELSON, Jim	Toronto
NEW DEMOCRATIC PARTY	Toronto
- Swart, Melvin	
OBERHOLTZER, Bob	Kitchener
ONTARIO ADJUSTERS ASSOCIATION	Toronto
- Cameron, James	
ONTARIO CHAMBER OF COMMERCE	Toronto
- Jackson, Linda	
- Tower, Roy	
ONTARIO CHIROPRACTIC ASSOCIATION	Toronto
- Haig, Dr. Robert	
- Smith, D.C.	
ONTARIO MOTOR VEHICLE ACCIDENT ASSOCIATION	Toronto
- Fisher, Alan	
ONTARIO MOTORCYCLE DEALERS ASSOCIATION	Toronto
- MacMillan, Bruce	
ONTARIO MUTUAL INSURANCE ASSOCIATION	Kitchener
- McIntyre, Mel	
ONTARIO RISK & INSURANCE MANAGEMENT SOCIETY	Toronto
- McBey, Kathryn L. F.	
- Meltzer, Susan	
- Hackett, Lloyd	
ONTARIO TRUCKING ASSOCIATION	Toronto
- Schroeder, Alf	
PEARCE, Robert	Toronto
PENSA, Claude	London
PLUMB, Leroy	Toronto
POUDRIER, Dr.	North Bay
PRIDE (People to Reduce Impaired Driving Everywhere)	London
- Wickham, Frank	
RELIABLE TAXI NEWMARKET (1978) LTD.	Toronto
- Gottlieb, Michael	
- Smalley, David	
RITCHIE, Scott	London
ROBB, Mrs. and Brian (son)	Toronto
ROBILLARD, Jim	North Bay
ROMANCHOOK, Terrence John	Windsor
ROSS, Phil	Toronto
ROYAL INSURANCE CANADA	Toronto
- Elms, Roy	
- Williams, Art	
SCHOOL BUS OPERATORS OF ONTARIO	Toronto
- Gordon, Hugh	
SEARLE, James	London
SETON, Mark	Kitchener
SINTAL, Richard	Toronto

SMITH, Don	Thunder Bay
SMITH, Philip	London
SORGE INSURANCE BROKERS LTD.	London
- Sorge, Mario D.	
SPIEGEL, Harvey	Toronto
STATE FARM INSURANCE	Toronto
- MacKenzie, J. R.	
- Fraser, F. Clifford	
- Temple, Carla	
STEIN, David & client	Toronto
STRNISA, Josef	Windsor
SUDBURY & DISTRICT LAW ASSOCIATION	North Bay
- O'Neil, Stephen	
SUNRISE CO-OPERATORS INC.	Toronto
- Dorkin, Larry	
SZALAKI, Alex	Windsor
TAILLEFER, Omer	Toronto
TARNOWSKI, Leonard	Toronto
TATOMIR, John	Windsor
THOMPSON, M.	Toronto
TORONTO TAXICAB BROKERAGE ASSOCIATION	Toronto
- Tory, John	
UBRIACO, Rita	Thunder Bay
VAN TAAK, John	Toronto
VINETTE, Edward	Toronto
WARKENTIN, B.	Toronto
WELLINGTON GENERAL INSURANCE	Toronto
- Collins, George R.	
- Andrachuk, John S.	
- Bertrand, François	
WELSH, Terry - U.S.A.	Windsor
(Speaking on behalf of the Michigan System)	
WILLIAMSON, Tom	London
WILSON, Angus	Ottawa
WRIGGLESWORTH, Edward	Toronto
W. W. CARTAGE LTD.	Toronto
- Sawyer, Harold	
YOUNG DRIVERS OF CANADA	Toronto
- Vézina, Monique	

LIST OF WRITTEN SUBMISSIONS RECEIVED FROM INDIVIDUALS

ADAM, Jacques
ANDERSON, John

BANGAY, A. W.
BATCHELOR, Dahn A.
BEACOCK, Steven
BLACK, Anthony S.
BROWN, Craig
BURRIDGE, Bruce W.

CABOT, J. Richard
CARSON, John K.
CARTWRIGHT, M. R.
CHADBAND, Edward E.
CHMARA, James
CHORNYJ, Gregory B.
COMERY, W. F.
CRABBE, Ronald H.
CROSSE, R. M.

DAWSON, Patricia
DAY, Mrs. M.
DOBRUCKI, Dan

EDDIE, C. R.
ELMS, Roy A.
ENCHIN, Ervin
ENSOM, B. Ernest

FERGUSON, Roderic
FLEMING, Robert
FLEURY, E. R.
FOWLER, Margarate et al.
FREESMAN, Boris G.
FRITZ, Prof. R. E.

GRUDA, E.

JOHNSON, Fred
JOHNSON, G. A.

KAPLAN, Dr. Ronald D.
KATZ, Robert D.
KOSTIUK, Andrew

LEONARD, John

MANN, Paul M.
MAURER, Peter
McCONNELL, Gregory E.
McTAVISH, Willson A.
MERSKEY, Harold
MILLION, Barry
MITCHELL, John H. R.
MIXER, Michael
MOSER, M. B.
MURRAY, J. B. M.

NELSON, A. J.
NOLL, Rhoda

OBERHOLTZER, Bob

PANZER, Stephen
PARMEGA, Brian
PHILPOTT, Lorne
POWELL, John
POYNTER, John G.

REED, Esther P.
REMPEL, H. I.
REMPEL, Raymond G.
RICHARDS, Bradley
RIZZI, Mike
RYAN, Chris

HAMMOND, R. G.
HANSEN, Helen & Robert
HAWKINS, Albert M.
HAY, Mrs. I. H.
HOBSON, Richard J.
HODGSON, J. Kent

TAILLEFER, Omer
TARNOWSKI, Leonard
TOWNSHEND, Gary

SEARLE, James D.
SEGAL, Murray A.
SHAW, Martin P.
SHOUR, Robert A. L.
SMITH, Don
SMITH, Ralph
SPIEGEL, Harvey
STRADIOTTO, Rino A.
STRNISA, Josef
SZALKAI, A. R.

WALES, Ian
WHITE, W.G.
WOOLFORD, Dr. B. J.

LIST OF WRITTEN SUBMISSIONS RECEIVED FROM ASSOCIATIONS

The Advocates' Society
Allstate Insurance Company of Canada
Arbitrators' Institute of Canada Inc.
Association of Canadian Insurers
Behavioural Health Inc. et al.
CAA (Ontario)
Canada Cycle Sports
Canadian Automotive Leasing Association
Canadian Bar Association - Ontario
Canadian Vintage Motorcycle Group
Christian Science Committee on Publication for Ontario
Coachman Insurance Company
Consumers' Association of Canada (Ontario)
Co-operators General Insurance Company
County of Carleton Law Association
Downtown Clinic Physiotherapy & Health Counselling
Economical Mutual Insurance Company
C.R. Eddie Engineering, Inc.
J.F. Enright Insurance Brokers, Inc.
Evergreen Rehabilitation Services Inc.
Fair Action in Insurance Reform (FAIR)
Federation of Canadian Municipalities
Hamilton Automobile Club
Hamilton Law Association
Head Injury Association of London & District
Institute of Law Research & Reform
Insurance Brokers Association of Ontario
Insurance Brokers Association of Waterloo
Insurance Bureau of Canada
Insurers' Advisory Organization Inc.
Kingsway General Insurance Co.
London Bar Association
McKellar Structured Settlements Inc.
Medico-Legal Society of Toronto
Motorcycle & Moped Industry Council and
The Canadian All-Terrain Vehicle Distributors Council
Munich Reinsurance Company of Canada
Municipal Affairs, Ministry of
New Democratic Party
Niagara Falls Taxi Ltd.
Ontario Advisory Council on Physically Handicapped
Ontario Chamber of Commerce
Ontario Chiropractic Association
Ontario Head Injury Association
Ontario Motorcycle Dealers Association
Ontario Motor Vehicle Accident Association

Ontario Mutual Insurance Association
Ontario Risk & Insurance Management Society
Ontario Trucking Association
Ontario Water Ski Association
Persons United for Self Help in Ontario
Phillips & Moore Insurance Brokers Ltd.
Pilipino Bayanihan of Mississauga
Powell Motorsport Management Inc.
PRIDE (People to Reduce Impaired Driving Everywhere)
Reinsurance Research Council
Reliable Taxi Newmarket (1978) Ltd.
Royal Insurance Co., Canada
Royal Ottawa Regional Rehabilitation Centre
Skillen-Squire Insurance Services Ltd.
Sorge Insurance Brokers Ltd.
State Farm Insurance Companies
Sunrise Co-operative Inc.
Toronto Taxicab Brokerages Association
Tourism and Recreation, Ministry of
Trial Lawyers Association of British Columbia
Wellington Insurance Company
Young Drivers of Canada
Zehr Insurance Brokers Ltd.
Zurich Insurance Company

APPENDIX II

LIST OF PERSONS CONTACTED

ACKER, Rodney
ASHBY, R. Mira
ATKEY, Jane

BALLOTT, Martin
BARNES, Paul
BATES, Tim
BAXTER, Bill
BEATTY, Gord
BELOBABA, Edward
BERGERON, Normand
BLACK, Anthony
BORIN, Jim

BORKENHAGEN, Peter
BRAY, Charles
BREEN, Mary
BRITT, Glen
BROWN, Mary
BUCKLASCHUCK, Hon. John
BURKETT, Michael

CAMI, Moby
CARTER, R. E.
CHELLEW, Gord
CHUTE, Brian
COOKE, Walter

DANZON, Patricia
DAVIS, Robert
DRAPER, John

EATON, Wayne
ELAIS, Roy

FINK, Bernhard

GAUDRY, Marc
GELINAS, Claude
GIBSON, Grant
GLASS, Jesse
GORDON, Chuck
GRAHAM, Murray

HALPERN, Paul
HAMMOND, Grant
HANSER, Linda
HAUER, Ezra
HAUGHY, Des
HICKLING, Herb
HILL, Sam
HOGG, Peter
HOLLINRAKE, Bud
HOLMES, Tom
HOLT, Bill
HUNTER, Robert

ISON, Terry

JOHNSON, Joan
JOHNSON, Patrick
JOHNSON, Robert
JOOST, Robert
JONES, C.R.

KAPLAN, Ron
KAPOOR, Shant
KLAR, Lewis
KYLE, Bill

LEVIN, Murray
LINDEN, Mr. Justice Allen
LOGAN, Gary
LYNDE, Richard
LYNDON, Jack

MAGNESUM, Eric
MAIDMAN, Veronica
MARTIN, Ken
MARTIN, Roger
MASTERSON, Stephen
McARTHUR, John
McCARTHY, Mike
McKAY, Donald

HALL, Mr. Justice Gordon

McKELLAR, Frank
MIELOCK, Cindy
MILLER, Sheldon
MILLER, Shelley
MURRAY, J.B.M

NEWCORBE, Tom
NEWTON, Brian
NICHOLSON, Jack
NOLET, Charles

VINETTE, Edward

O'CONNELL, Jeffrey
O'DONNELL, Vince
O'MALLEY, Tom
OSBORNE, Phillip

WACHOWICH, Mr. Justice Allen
WADDAMS, Stephen
WALKE, R. J.
WALSH, Richard
WARREN-BOULTON, Frederick
WEBBER, Peter
WEIR, John P.
WELLS, Linda
WESTER, Gerald
WEXLER, Steven
WILDE, Alex
WILDE, Gerald

PARADIS, Gilles
PETERSON, Don
PICKARD, Madam Justice Ellen
PETRISHEN, T.M.
PRICHARD, J. Robert S.

ZACHO, Gene

QUELLER, Fred

RAMSAY, Glen
RAPHAEL, Bert
REA, Sam
REMPEL, Raymond
RICHARDS, Ed
RINGSTROM, Dennis
ROWE, Kirby

SAUNDERS, Harry
SAUVAGEAU, Léon-Paul
SCHRADER, Richard
SCHWARTZ, Gary
SEGAL, Murray
SIGURDSON, S. Glenn
SILVER, Robert
STAPLETON, John
STAR, Bill
STAUB, Jane
SUGARMAN, Stephen
SWARTZ, Lee

TAYLOR, Terry
THOMPSON, George
THOMPSON, Murray
TREBILCOCK, Michael

APPENDIX III

Motor Vehicle Claims Surveys

by

Joe S. Cheng, F.C.A.S., F.C.I.A.

Eckler Partners Ltd.
Consulting Actuaries

Report on Motor Vehicle Claims Surveys

Bodily Injury Claim Survey Questionnaire
(Blue Form)

Summary Analysis of Motor Vehicle Bodily
Injury Claim Survey (Blue Form)

Accident Benefit Claim Survey Questionnaire
(Yellow Form)

Summary Analysis of Motor Vehicle Accident
Benefit Claim Survey (Yellow Form)

Bodily Injury Claims Information Sheet
(Green Form)

Summarized Results from Supplementary
Bodily Injury Claims Survey

Report on the Change in Loss Cost as a
Result of Changes in Accident Benefits and
Compensation Issues

REPORT ON MOTOR VEHICLE CLAIMS SURVEY

Objectives

We have been retained by Mr. Justice Coulter A. Osborne, Commissioner of the Inquiry Into Motor Vehicle Accident Compensation in Ontario, to conduct three surveys of Ontario automobile insurance claims.

The purpose of these surveys was to determine who is injured; who is compensated; who is not compensated; how much compensation is paid; the breakdown of compensation paid through first and third party automobile insurance; and from what sources compensation is paid. The surveys were also designed to identify transaction costs. The claims surveys were thus designed to:

1. Break down the claims paid into their major components in order to determine what was paid for specific kinds of compensation, including:
 - (a) Family Law Reform Act/Family Law Act
 - (b) prejudgment interest
 - (c) gross-up
 - (d) past income loss
 - (e) future income loss
 - (f) non-pecuniary loss
 - (g) party and party costs
 - (h) future care costs
2. Compile a profile of both accidents (type of accident and degree of fault) and the injured making first or third party claims (socio-economic characteristics of claimants, type and extent of injuries, role of claimants in accidents and estimates of actual losses).
3. Collect information concerning processing of the claims. This included information on the timeliness of payments and settlement, the use

of counsel and the courts, the amount of payments made and the transaction costs involved.

4. Collect information concerning the amount of compensation those injured in motor vehicle accidents received from collateral sources.

To deal with these issues, we designed and conducted three surveys, two with respect to bodily injury claims and, one involving accident benefits claims.

Methodology

In early March, 1987, we designed two independent claims surveys. The first survey covered Ontario automobile third party bodily injury liability claims closed during 1986 (the B.I. survey); the second survey covered accident-benefits claims for accidents which occurred in 1985 (the A.B. survey); the third survey was designed to capture data unavailable in the first survey, specifically collateral source information (the C.S. survey). For the purposes of this report, the results of the third survey were treated as part of the bodily injury liability claims survey.

Accepted statistical sampling techniques were used. Each sample contained approximately 2% of the total claims in each category. Statistical sampling generally uses a much smaller percentage of the total population, but because of the detail required and the number of possible responses to each question in our surveys, a larger sample size was used. In total, we accepted 1,594 forms out of 1,619 submitted from the B.I. survey; 1,528

claims from the 1,702 submitted from the A.B. survey and 1,347 forms from the 1,403 submitted for the C.S. survey. Statistical theory suggests that this sample size is sufficient to reproduce a reasonable representation of automobile insurance claims and claimants in Ontario.

To ensure that the sample accurately represented the geographic distribution of claims across the province and the mix of vehicle types, two controls were placed on the random sampling process. We analysed the confidential claims information of 15 large automobile insurance companies provided to us by the Insurance Bureau of Canada; from these 15 companies, an appropriate number was chosen (9 for the B.I. survey and 12 for the A.B. survey) so that the resulting sample would exhibit a claims distribution by region similar to that of the entire industry. Because differences in distribution systems were considered to be significant, each sample contained either one or two direct-writing companies. To ensure that the samples accurately reflected the mix of vehicle types, we drew the claims from three strata: private passenger cars, commercial trucks and motorcycles. The results from each group were then appropriately weighted to reflect the prominence of each in the total vehicle population.

Bodily Injury Liability Claims Survey.

The nine insurers were asked to submit, in either magnetic form or hard copy, a complete list of Ontario automobile bodily injury claims with settlement dates in 1986. To eliminate uncertainty arising from the adequacy of reserves, only closed liability claims were used. We

determined the number of claims required from each company, necessary to reflect geographic distribution and differences in marketing methods; we then randomly selected the required number of claims for analysis. The companies were given claim identification numbers and instructions for completing the survey forms.

Internal Verification During Course of Survey

To determine if our sample size was adequate, when one-third of the data was returned, we analyzed the results of that data; we continued to monitor the results as additional data were received.

An inadequate sample would have exhibited significant variations in the distribution of the data; we found that from the one-third point forward distributions were consistent with those in the preliminary analysis. We therefore concluded that increasing the sample size was not necessary to the reliability of the survey.

External Verification by Result

Three specific external checks corroborated the results of the Bodily Injury Liability Survey.

The first concerned the components of bodily injury claims. In 1986, the Insurance Bureau of Canada conducted a claims survey using only bodily injury claims in excess of \$25,000. An examination of the data in claims over \$25,000 in our sample reflected a distribution very similar to that of the industry study.

The second check was a gross weekly wage comparison. The average gross weekly wage for liability claimants in the claims survey was \$428. The Ontario weekly industrial wage in 1986 was \$427.31; thus, the liability claimants considered in the bodily injury claims survey were representative of the provincial average. The accident-benefit claimants on the other hand, had an average gross weekly wage of only \$378. This was to be expected and is due to the second payor feature of A.B. coverage. Those with higher than average earnings usually had employment-related benefits. They may have either been ineligible for benefits, or decided not to file a claim.

The third check was an age distribution comparison of bodily injury and accident benefit claimants with Ministry of Transportation and Communications drivers involved in accidents data. It is apparent from the table below that the percentage of liability and accident benefit claimants in each age group corresponds very closely to the percentage of drivers involved in accidents from each age group.

Age	Licensed Drivers*	Drivers involved in accidents*	Liability Claimants	Accident Benefit Claimants
Under 16	-	0.1	6.4%	6.1%
16 - 20	7.3%	13.8	13.3%	13.0%
21 - 24	10.1%	14.6	13.7%	16.8%
25 - 34	25.5%	26.1	26.8%	24.8%
35 - 44	21.3%	18.0	17.4%	16.6%
45 - 54	14.5%	10.8	10.5%	10.8%
55 - 64	12.1%	7.7	6.9%	7.9%
65 & over	9.3%	4.8	4.8%	3.95
Unknown	-	4.0	-	-

*From: 1985 Ontario Road Safety Annual Report, Table 2.22.

Supplementary Bodily Injury Claims/Collateral Source Survey

The first Bodily Injury Survey produced insufficient information in two areas: collateral benefits and gross-up. Much of this problem was the result of the companies' failure to maintain records on these subjects. We therefore conducted a supplementary survey to capture this information. Thirty-five insurers, constituting 90% of the Ontario automobile insurance market, were asked to participate. All Ontario automobile bodily injury claims closed by the relevant insurers between April 13 and May 24, 1987 were examined. An independent on-site file audit confirmed the high quality of the data. This second bodily injury survey developed reliable data on collateral benefits. It did not provide useful data on gross-up.

Accident Benefits Claim Survey

After determining the number of claims required from each insurer to reflect proper geographic representation and marketing methods, we asked each of 12 insurers to submit a complete list of Ontario accident-benefit claims with accident dates in 1985. From each list we randomly drew the predetermined number of claims. Each insurer was given the claim identification numbers selected and instructions for completing the form.

Accident-benefit claims involving permanent disability may remain outstanding for decades. Because we wanted to include some permanent disability claims in the sample, we decided to accept outstanding claims as well as closed claims. This did not detract from the reliability

of the data since, in our experience, reserves for unpaid accident-benefit claims are reasonably accurate.

Internal Verification During the Course of the Accident Benefit Survey

In order to ensure that the sample size was sufficiently large, we performed a check similar to that done for the B.I. survey. We observed reasonably stable results as the Accident Benefits survey data were compiled. We concluded that increasing the sample size was not necessary to the reliability of the data.

Note:

Throughout the report, two terms have specific meaning in an insurance context and the following should be noted:

1. Claim

A claim is a file in which one or more claimants have received or will receive payments from the insurance company reporting the data. A claim can be for first party coverage or third party liability coverage.

An insurance company participating in both surveys may report a third party liability claim and a first party accident-benefit claim arising from the same accident, if both claims were in our respective samples.

2. Claimant

A claimant is a person who has either received or will receive payment from the insurance company reporting the data. A person who makes a claim, but does not

receive payment, is not considered a claimant in this survey.

These definitions may not be the same as those used by the insurance companies.

The Insurance Bureau of Canada defines a claim differently in its statistical plan. It does not define claimant.

BLUE FORM

General Instructions

1. Indicate company number, your initials and claim number clearly for future reference.
2. This survey form is to be completed for each claimant. For example, if an accident gives rise to three claimants, three separate forms have to be completed.
3. All dollar figures are in whole dollars. Absolutely no cent should be shown.
4. All dollar figures which should balance to the answers of other questions will be checked.
5. All dates are in international convention. They are shown as year, month and day.
6. Do not leave date blank. Use UN for unknown only if the information is unavailable.
7. Where a dollar amount is expected, a blank will imply 0. If there is no information to make an estimate, use UN for unknown.
8. Where a check mark "X" or a selection "a number" is expected, you MUST pick the most appropriate category. Otherwise, the form will be returned.

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MOTOR VEHICLE B.I. CLAIM SURVEY

- [1] Company number | | | |
- [2] Your initials | | | |
- [3] Claim number | | | | | | | | | | | | | | | |
- [4] Claimant number | | |
- [5] Coverage (check one box) | | B.I. | | SEF 42/44
- [6] Policy limit (section A) | | | | | 0 0 0 | Complete the next limit figure if applicable, limit has been reduced to | | | | | 0 0 0 | due to breach of policy conditions.
- [7] Claimant category | |
- | | |
|----------------------------|---|
| 1: third party driver | 5: passenger (not named insured) in insured's vehicle |
| 2: third party passenger | |
| 3: named insured driver | 6: pedestrian |
| 4: named insured passenger | 7: other |
| in insured's vehicle | |
- [8] Sex of claimant | | 1: male 2: female
- [9] Age of claimant | | | as of the date of accident
- [10] Accident type | | 1: single vehicle 2: multiple vehicle
- [11] Vehicle type | | insured's vehicle | | claimant's vehicle
- 1: car 2: truck/van 3: motorcycle 4: bus 5: snow vehicle 6: ATV

- 2] Degree of fault (based on your assessment): your insured %
claimant % The two figures need not add up to 100%.
- 3] IBC statistical territory code of your insured vehicle.
- 4] Place of accident (check one box) Ontario Quebec
 other jurisdictions in Canada U.S.A.
- 5] IBC class code
- 6] Date of accident YY MM DD
- 7] Date when B.I. reserve was opened YY MM DD
- 8] (a) Was there any request by the plaintiff/representative to have payment
in advance Yes No
- (b) Did your company offer to make payment in advance Yes No
- (c) Date of first payment to claimant in advance
YY MM DD
If there was no payment in advance, check here and indicate 0 in
question 19.
- 9] Amount of first payment to claimant \$
Total amount of payment in advance \$
- 20] First verbal offer to settle was made by claimant/representative
 your company neither party (i.e. no verbal offer was made)
Date of the first verbal offer to settle
YY MM DD
- 21] First written offer to settle was made by claimant/representative
 your company neither party (i.e. no written offer was made)
Date of first written offer to settle

YY 1 9 MM DD

[22] Date of settlement (i.e. last payment to claimant)

YY 1 9 MM DD

[23] Condition of claimant 1: deceased 2: injured

[24] Type of injury (Check more than one if necessary)

INSTRUCTION: first check the part(s) of the body injured, then check the type(s) of injury corresponding to the part of the body.

Part of Body	Description of Injury
<u> </u> <u> </u> 99 none	<u> </u> <u> </u> nominal value (shaken up) <u> </u> <u> </u> psychological trauma
<u> </u> <u> </u> 0 brain or spinal column	<u> </u> <u> </u> paraplegic or quadraplegic or vegetative state <u> </u> <u> </u> other
<u> </u> <u> </u> 1 head	<u> </u> <u> </u> fracture <u> </u> <u> </u> concussion
<u> </u> <u> </u> 2 face	<u> </u> <u> </u> fracture <u> </u> <u> </u> laceration with scar <u> </u> <u> </u> laceration - no scar
<u> </u> <u> </u> 3 eye	<u> </u> <u> </u> partial loss or loss of use of 1 or 2 eyes <u> </u> <u> </u> total loss or loss of use of 1 or 2 eyes
<u> </u> <u> </u> 4 ears	<u> </u> <u> </u> partial loss or loss of use of 1 or 2 ears <u> </u> <u> </u> total loss or loss of use of 1 or 2 ears
<u> </u> <u> </u> 5 nose	<u> </u> <u> </u> resulting in disfigurement <u> </u> <u> </u> no disfigurement
<u> </u> <u> </u> 6 teeth and jaw	<u> </u> <u> </u> fracture <u> </u> <u> </u> loss of teeth <u> </u> <u> </u> other

24] Continued

Part of Body	Description of Injury
<u> </u> <u> </u> 7 voice and larynx	<u> </u> <u> </u> loss of voice <u> </u> <u> </u> other
<u> </u> <u> </u> 8 neck	<u> </u> <u> </u> soft tissue <u> </u> <u> </u> vertebrae/disc fracture <u> </u> <u> </u> psychological trauma
<u> </u> <u> </u> 9 back	<u> </u> <u> </u> soft tissue <u> </u> <u> </u> vertebrae/disc fracture <u> </u> <u> </u> psychological trauma
<u> </u> <u> </u> 10 chest and ribs	<u> </u> <u> </u> fracture <u> </u> <u> </u> other
<u> </u> <u> </u> 11 internal organs	<u> </u> <u> </u> surgery is required <u> </u> <u> </u> other
<u> </u> <u> </u> 12 shoulder	<u> </u> <u> </u> soft tissue <u> </u> <u> </u> fracture <u> </u> <u> </u> laceration <u> </u> <u> </u> other
<u> </u> <u> </u> 13 arm and hand	<u> </u> <u> </u> fracture <u> </u> <u> </u> loss of arm or hand <u> </u> <u> </u> loss of both arms or hands <u> </u> <u> </u> laceration <u> </u> <u> </u> loss of fingers <u> </u> <u> </u> other
<u> </u> <u> </u> 14 elbow	<u> </u> <u> </u> fracture <u> </u> <u> </u> other
<u> </u> <u> </u> 15 wrist	<u> </u> <u> </u> fracture <u> </u> <u> </u> other
<u> </u> <u> </u> 16 pelvis and hip	<u> </u> <u> </u> fracture <u> </u> <u> </u> other
<u> </u> <u> </u> 17 leg and foot	<u> </u> <u> </u> fracture <u> </u> <u> </u> loss of leg or foot <u> </u> <u> </u> laceration <u> </u> <u> </u> loss of both legs or feet <u> </u> <u> </u> other
<u> </u> <u> </u> 18 knee	<u> </u> <u> </u> soft tissue <u> </u> <u> </u> fracture <u> </u> <u> </u> other
<u> </u> <u> </u> 19 ankle	<u> </u> <u> </u> fracture <u> </u> <u> </u> other

30] Continued

(c) Party to party costs including
disbursements

\$ | | | | | | | | | |

(d) Prejudgement interest

\$ | | | | | | | | | |

| | stated in settlement

| | estimated

31] Family Law Reform Act/Family Law Act claims:

(a) Spouse: Amount paid

\$ | | | | | | | | | |

(b) Children: Number of claimants

| | | |

Number of claimants paid

| | | |

Amount paid

\$ | | | | | | | | | |

(c) Other relatives Number of claimants

| | | |

and others: Number of claimants paid

| | | |

Amount paid

\$ | | | | | | | | | |

32] Breakdown of internal expenses (exclude staff adjuster):

(a) Fees paid to insurer's lawyer

\$ | | | | | | | | | |

(b) Fees allocated to in-house lawyer

\$ | | | | | | | | | |

(c) Cost of independent adjuster

\$ | | | | | | | | | |

(d) Cost of defence medical

\$ | | | | | | | | | |

(e) Cost of other experts

\$ | | | | | | | | | |

(f) Other

\$ | | | | | | | | | |

TYPE OF COLLATERAL BENEFITS For questions 33 to 35: Try your best to fill in
the amount. Use the unknown box only if you have no information.

33] Section B benefits | | unknown

medical

\$ | | | | | | | | | |

rehabilitation

\$ | | | | | | | | | |

disability

\$ | | | | | | | | | |

housewife disability benefit

\$ | | | | | | | | | |

funeral

\$ | | | | | | | | | |

death

\$ | | | | | | | | | |

Quebec Part III

\$ 1 1 1 1 1 1 1 1

total

\$ 1 1 1 1 1 1 1 1

[34] Employer salary continuance programs | | unknown

Sick leave with pay | | | | % salary , \$ | | | | | | | | | |

Short term disability | | | | % salary , \$ | | | | | | | | | |

Long term disability | | | | % salary , \$ | | | | | | |

[35] Government programs | | unknown

U. I. C. \$ 1 1 1 1 1 1 1 1 1

C. P. P. \$ 1 1 1 1 1 1 1 1

Workers' Compensation	\$ 1 1 1 1 1 1 1 1
-----------------------	--------------------

Other	\$ 1 1 1 1 1 1 1 1
-------	--------------------

[36] Date when your company received the first medical report

YY | 1 | 9 | | | MM | | | DD | | | | | none was received

[37] Additional information (check yes or no):

YES

NO

(a) Was claimant represented by counsel? | | | |

(b) Was action commenced? | | | |

(c) Was there examination for discovery? | | |

(d) Was case pre-tried?				
-------------------------	--	--	--	--

(e) Was case tried by jury? | | | |

(f) Was there an appeal? | | |

(g) If appealed, was case appealed by plaintiff? | | |

[38] If claim settled, indicate when settlement was concluded (check only ONE)

(a) before action commenced

(b) after action commenced but before examination for discovery | |

(c) after examination for discovery but before pre-trial

(d) at pre-trial or as an immediate consequence (i.e. within 10 days) of pre-trial

(e) between pre-trial and date action called for trial | |

(f) at trial

Did gross value of claim exceed policy limit in question 6?

	Yes	No
1. Do you have a current driver's license?		
2. Do you have a current vehicle registration?		
3. Do you have a current insurance policy?		
4. Do you have a current title?		
5. Do you have a current sales tax certificate?		
6. Do you have a current license plate?		
7. Do you have a current title transfer fee?		
8. Do you have a current title transfer tax?		
9. Do you have a current title transfer fee?		
10. Do you have a current title transfer tax?		

If yes, what was the gross value \$ | | | | 0 0 0 |

Was the claim a structured settlement? | | Yes | | No

If yes, answer the following:

(a) gross amount of claim [from question 29] \$ | | | | | | | |

(b) interim and other payments	\$
--------------------------------	----

(c) party to party costs [from 30 (c)]	\$
--	----

(d) cost of annuity [must equal

40 (a) - (b) - (c)] \$ | | | | | | | |

(e) brokerage fee or other fee (if known) \$ | | | | | | | |

SUMMARY ANALYSIS OF MOTOR VEHICLE B.I. CLAIM SURVEY (BLUE FORM)

QUESTION 6

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	716	371	74	1161
NUMBER USEABLE	716	370	74	1160

	PRIVATE PASSENGER %accidents	COMMERCIAL %accidents	MOTORCYCLE %accidents	WEIGHTED %accident
POLICY LIMIT OF INSURED				
UP TO \$200,000	7.4	8.1	36.5	7.7
\$300,000	8.8	3.8	8.1	8.4
\$500,000	49.4	28.1	47.3	47.9
\$1,000,000	32.5	53.5	6.8	33.8
OVER \$1,000,000	1.8	6.5	1.4	2.1

QUESTION 7

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	1394	555	91	2040

	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimant
CLAIMANT CATEGORY				
THIRD PARTY DRIVER	58.7	58.7	28.6	58.4
THIRD PARTY PASSENGER	24.6	26.3	12.1	24.6
NAMED INSURED DRIVER	0.2	0.2	1.1	0.2
NAMED INSURED PASSENGER	1.6	0.9	7.7	1.7
PASSENGER (NOT NAMED INSURED)	6.2	5.4	36.3	6.4
PEDESTRIAN	7.6	7.0	12.1	7.6
OTHER	1.1	1.4	2.2	1.1

QUESTION 8

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	1394	555	91	2040

	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimant
SEX OF CLAIMANT				
MALE	54.0	52.4	52.7	53.9
FEMALE	46.0	47.6	47.3	46.1

QUESTION 9

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
ER OF RECORDS	1394	555	91	2040
ER USEABLE	1370	548	89	2007

OF CLAIMANT	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
THAN 16 YRS	6.1	8.6	16.9	6.4
O 18 YRS	5.8	4.9	14.6	5.9
O 20 YRS	7.5	6.0	11.2	7.5
O 22 YRS	7.3	6.4	10.1	7.3
O 24 YRS	6.5	5.3	5.6	6.4
O 29 YRS	14.9	11.3	13.5	14.6
O 34 YRS	12.0	14.1	11.2	12.2
O 39 YRS	10.6	9.9	7.9	10.5
O 44 YRS	7.0	7.3	1.1	7.0
O 49 YRS	5.5	6.8	1.1	5.5
O 54 YRS	4.9	7.8	2.2	5.1
O 59 YRS	3.6	4.2	4.5	3.7
O 64 YRS	3.3	2.6	0.0	3.2
O 69 YRS	2.1	2.4	0.0	2.1
THAN 69 YRS	2.8	2.6	0.0	2.7

QUESTION 10

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
ER OF RECORDS	716	371	74	1161
ER USEABLE	716	371	74	1161

OF ACCIDENT	PRIVATE PASSENGER %accidents	COMMERCIAL %accidents	MOTORCYCLE %accidents	WEIGHTED %accidents
LE VEHICLE	13.7	12.1	33.8	13.8
I VEHICLE	86.3	87.9	66.2	86.2

QUESTION 11

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	716	371	74	1161
NUMBER USEABLE	646	181	61	888

ACCIDENT VEHICLES	PRIVATE PASSENGER %accidents	COMMERCIAL %accidents	MOTORCYCLE %accidents	WEIGHTED %accident
INSURED OTHER				
CAR - SINGLE VEHICLE	13.2	0.0	0.0	12.1
CAR - CAR	75.9	0.0	0.0	69.8
CAR - TRUCK	6.8	0.0	0.0	6.3
CAR - MOTORCYCLE	3.9	0.0	0.0	3.6
CAR - OTHER	0.3	0.0	0.0	0.3
INSURED OTHER				
TRUCK - SINGLE VEHICLE	0.0	9.9	0.0	0.7
TRUCK - CAR	0.0	73.5	0.0	5.1
TRUCK - MOTORCYCLE	0.0	12.7	0.0	0.9
TRUCK - TRUCK	0.0	2.8	0.0	0.2
TRUCK - OTHER	0.0	1.1	0.0	0.1
INSURED OTHER				
MOTORCYCLE - SINGLE VEHICLE	0.0	0.0	32.8	0.3
MOTORCYCLE - CAR	0.0	0.0	49.2	0.5
MOTORCYCLE - TRUCK	0.0	0.0	1.6	0.0
MOTORCYCLE - MOTORCYCLE	0.0	0.0	16.4	0.2
MOTORCYCLE - OTHER	0.0	0.0	0.0	0.0

QUESTION 12

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	1386	546	89	2021

DEGREE OF FAULT OF INSURED	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimant
NONE	1.6	2.0	2.2	1.6
LESS THAN 100%	12.6	11.2	25.8	12.7
100%	85.8	86.8	71.9	85.7

QUESTION 13

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	716	371	74	1161
NUMBER USEABLE	716	371	74	1161

IBC STATISTICAL TERRITORY	PRIVATE PASSENGER %accidents	COMMERCIAL %accidents	MOTORCYCLE %accidents	WEIGHTED %accident
METRO TORONTO	39.7	32.1	27.0	39.0
URBAN (NOT TORONTO)	38.7	36.7	35.1	38.5
RURAL	21.6	31.3	37.8	22.5

QUESTION 14

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
RECORDS	716	371	74	1161
SEABLE	716	371	74	1161
ACCIDENT	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	WEIGHTED
	%accidents	%accidents	%accidents	%accidents
	98.9	97.6	98.6	98.8
	0.3	0.0	0.0	0.3
WINCES	0.1	0.8	1.4	0.2
	0.7	1.6	0.0	0.8

QUESTION 16

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
RECORDS	716	371	74	1161
SEABLE	716	371	74	1161
ACCIDENT	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	WEIGHTED
	%accidents	%accidents	%accidents	%accidents
R BEFORE 1981	4.7	6.7	5.4	4.9
82	5.4	8.6	4.1	5.7
83	9.4	10.0	20.3	9.5
84	17.0	19.9	23.0	17.3
85	31.3	38.3	27.0	31.7
86	32.1	16.4	20.3	30.9

QUESTION 18 A & B

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
RECORDS	1394	555	91	2040
SEABLE	1394	555	91	2040
PAYMENT	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	WEIGHTED
	%claimants	%claimants	%claimants	%claimants
BY PLAINTIFF	3.8	4.5	4.4	3.9
COMPANY	7.8	6.7	13.2	7.8
	90.6	89.9	85.7	90.5

QUESTION 18C

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	130	50	15	195
TIME TILL ADVANCED PAYMENT	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
WITHIN ONE MONTH	21.5	6.0	33.3	20.6
1 TO 2 MONTHS	4.6	6.0	6.7	4.7
2 TO 3 MONTHS	7.7	0.0	0.0	7.1
3 TO 4 MONTHS	4.6	8.0	6.7	4.9
4 TO 5 MONTHS	3.1	6.0	6.7	3.3
5 TO 6 MONTHS	5.4	4.0	13.3	5.4
6 TO 9 MONTHS	10.8	12.0	0.0	10.7
9 TO 12 MONTHS	9.2	14.0	6.7	9.5
12 TO 24 MONTHS	21.5	26.0	26.7	21.9
24 TO 36 MONTHS	8.5	12.0	0.0	8.6
36 TO 48 MONTHS	2.3	4.0	0.0	2.4
48 TO 60 MONTHS	0.8	0.0	0.0	0.7
MORE THAN 60 MONTHS	0.0	2.0	0.0	0.1

QUESTION 22

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	1362	542	89	1993
TIME TILL CLAIM SETTLED	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
WITHIN ONE MONTH	14.6	9.0	14.6	14.2
1 TO 2 MONTHS	5.6	3.3	9.0	5.5
2 TO 3 MONTHS	5.7	3.1	4.5	5.5
3 TO 4 MONTHS	5.4	4.4	2.2	5.3
4 TO 5 MONTHS	4.3	3.5	2.2	4.3
5 TO 6 MONTHS	3.8	2.2	1.1	3.8
6 TO 9 MONTHS	9.4	8.1	5.6	9.3
9 TO 12 MONTHS	8.1	8.9	7.9	8.8
12 TO 24 MONTHS	23.9	29.5	16.9	24.2
24 TO 36 MONTHS	10.3	12.2	21.3	10.9
36 TO 48 MONTHS	5.8	7.6	9.0	6.8
48 TO 60 MONTHS	1.7	5.4	4.5	2.8
MORE THAN 60 MONTHS	1.6	2.8	1.1	1.8
MEDIAN TIME (in months)	10.0	15.0	15.0	10.9

QUESTION 23

	QUESTION 23			
	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	1394	555	91	2040
	QUESTION 24			
	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	WEIGHTED
CONDITION OF CLAIMANT	%claimants	%claimants	%claimants	%claimants
CEASED	1.8	2.9	1.1	1.9
INJURED	98.2	97.1	98.9	98.1

QUESTION 24

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	1394	555	91	2040
TYPE OF INJURY	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
NONE				
NOMINAL VALUE (SHAKEN UP)	10.6	7.4	9.9	10.4
PSYCHOLOGICAL TRAUMA	1.1	0.5	1.1	1.1
BRAIN OR SPINAL COLUMN				
PARAPLEGIC, QUADRAPLEGIC OR VEGETATIVE STATE	0.1	0.4	0.0	0.1
OTHER	0.6	0.5	0.0	0.6
HEAD				
FRACTURE	0.4	1.1	1.1	0.4
CONCUSSION	5.0	5.6	11.0	5.1
FACE				
FRACTURE	0.1	0.4	1.1	0.2
LACERATION WITH SCAR	2.4	1.6	0.0	2.4
LACERATION - NO SCAR	2.8	5.2	4.4	3.0
EYES				
PARTIAL LOSS OR LOSS OF USE OF 1 OR 2 EYES	0.4	0.7	0.0	0.4
TOTAL LOSS OR LOSS OF USE OF 1 OR 2 EYES	0.0	0.0	0.0	0.0
EARS				
PARTIAL LOSS OR LOSS OF USE OF 1 OR 2 EARS	0.2	0.0	0.0	0.2
TOTAL LOSS OR LOSS OF USE OF 1 OR 2 EARS	0.0	0.0	0.0	0.0
NOSE				
RESULTING IN DISFIGUREMENT	0.2	0.2	1.1	0.2
NO DISFIGUREMENT	0.5	1.3	2.2	0.6
TEETH AND JAW				
FRACTURE	0.5	0.4	3.3	0.5
LOSS OF TEETH	0.9	0.9	2.2	0.9
OTHER	1.4	0.7	2.2	1.4
VOICE AND LARYNX				
LOSS OF VOICE	0.0	0.0	0.0	0.0
OTHER	0.0	0.0	0.0	0.0
NECK				
SOFT TISSUE	58.7	58.9	27.5	58.4
VERTABRAE/DISC FRACTURE	0.6	0.5	1.1	0.6
PSYCHOLOGICAL TRAUMA	3.4	2.9	1.1	3.3
BACK				
SOFT TISSUE	36.7	35.3	20.9	36.5
VERTABRAE/DISC FRACTURE	0.7	1.8	1.1	0.8
PSYCHOLOGICAL TRAUMA	1.5	3.6	0.0	1.6
CHEST AND RIBS				
FRACTURE	1.3	2.3	1.1	1.4
OTHER	5.1	4.3	4.4	5.0

QUESTION 24 continued

TYPE OF INJURY	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
INTERNAL ORGANS				
SURGERY IS REQUIRED	0.5	0.7	0.0	0.5
OTHER	0.8	1.1	1.1	0.8
SHOULDER				
SOFT TISSUE	14.9	12.3	9.9	14.7
FRACTURE	0.9	0.5	4.4	0.9
LACERATION	0.3	0.2	1.1	0.3
OTHER	0.9	1.1	2.2	1.0
ARM AND HAND				
FRACTURE	0.9	1.3	4.4	1.0
LOSS OF ARM OR HAND	0.0	0.0	0.0	0.0
LOSS OF BOTH ARMS OR HANDS	0.0	0.0	0.0	0.0
LACERATION	1.5	1.6	3.3	1.5
LOSS OF FINGERS	0.0	0.0	0.0	0.0
OTHER	5.2	6.3	2.2	5.2
ELBOW				
FRACTURE	0.1	0.0	0.0	0.1
OTHER	2.3	3.1	2.2	2.3
WRIST				
FRACTURE	0.7	1.4	0.0	0.8
OTHER	1.7	0.7	6.6	1.7
ELVIS AND HIP				
FRACTURE	1.1	1.1	3.3	1.1
OTHER	2.5	2.3	4.4	2.5
LEG AND FOOT				
FRACTURE	2.0	3.2	22.0	2.3
LOSS OF LEG OR FOOT	0.0	0.0	0.0	0.0
LACERATION	1.5	0.9	7.7	1.5
LOSS OF BOTH LEGS OR FEET	0.0	0.0	0.0	0.0
OTHER	4.2	5.2	9.9	4.3
KNEE				
SOFT TISSUE	7.7	5.9	12.1	7.6
FRACTURE	0.6	0.5	0.0	0.6
OTHER	2.5	3.2	13.2	2.7
FRACTURE	0.6	1.4	5.5	0.7
OTHER	1.8	2.0	3.3	1.8

QUESTION 25

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	1333	537	89	1959
EMPLOYMENT	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimant
EMPLOYED	64.7	62.9	59.6	64.5
HOMEMAKER	8.6	9.5	2.2	8.6
STUDENT	10.4	10.4	20.2	10.5
RETIRED	3.8	3.0	0.0	3.7
UNEMPLOYED	6.0	6.3	11.2	6.1
EMPLOYED PARTTIME	4.7	4.8	5.6	4.7
PRESCHOOLER	1.1	0.7	0.0	1.1
OTHER	0.8	2.2	1.1	0.9

QUESTION 26

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1333	537	89	1959
NUMBER USEABLE	991	396	58	1445
TYPE OF EMPLOYMENT	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimant
SELF EMPLOYED	12.6	11.9	10.3	12.5
MANAGERIAL/PROFESSIONAL	20.1	18.9	10.3	19.9
CLERICAL	17.3	18.7	12.1	17.3
MANUAL	50.1	50.5	67.2	50.3

QUESTION 27

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	991	396	58	1445
NUMBER USEABLE	702	284	48	1034
GROSS WEEKLY EMPLOYMENT INCOME	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimant
LESS THAN \$200	17.0	15.8	29.2	17.0
\$201 TO \$300	22.9	20.1	22.9	22.7
\$301 TO \$400	19.4	19.4	16.7	19.3
\$401 TO \$500	15.1	20.1	18.8	15.5
\$501 TO \$600	8.0	9.2	0.0	8.0
\$601 TO \$700	6.6	4.9	4.2	6.4
\$701 TO \$800	4.8	4.9	2.1	4.8
\$801 TO \$900	1.4	2.1	2.1	1.5
\$901 TO \$1000	2.0	1.4	2.1	2.0
MORE THAN \$1000	2.8	2.1	2.1	2.8
AVERAGE \$	426.96	439.75	372.88	427.31

QUESTION 28

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	668	310	55	1033

ANNUAL TIME LOSS	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
WEEK	22.5	16.5	5.5	21.9
WEEKS	12.0	10.0	7.3	11.8
WEEKS	6.7	6.8	1.8	6.7
WEEKS	3.9	5.8	7.3	4.1
MONTHS	15.0	11.6	10.9	14.7
MONTHS	10.8	8.1	18.2	10.7
MONTHS	6.4	6.8	3.6	6.4
MONTHS	4.8	3.2	1.8	4.7
MONTHS	2.7	2.3	0.0	2.6
MONTHS	2.7	2.9	7.3	2.8
MONTHS	0.9	2.9	0.0	1.0
MONTHS	0.9	2.9	1.8	1.0
MONTHS	2.1	1.3	3.6	2.1
MONTHS	0.4	0.3	3.6	0.5
MONTHS	0.3	0.6	3.6	0.4
YEARS	4.2	12.3	12.7	4.8
YEARS	1.3	2.3	5.5	1.5
YEARS	0.4	0.6	3.6	0.5
YEARS	0.3	1.3	1.8	0.4
PERMANENT	1.6	1.6	0.0	1.6

AVERAGE LOSS (IN WEEKS) perm=5yrs	18.6	28.8	37.1	19.5
AVERAGE LOSS (IN WEEKS) perm=20yrs	31.4	41.4	37.1	32.2

ANNUAL LOSS (IN WEEKS) excluding permanent	5.0	7.0	12.0	5.2
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Note 1: In calculating average, "perm=5yrs" means permanent disabilities are considered to be a 5yr loss.
Note 2: In calculating average, "perm=20yrs" means permanent disabilities are considered to be a 20yr loss.

QUESTION 29

	PRIVATE PASSENGER		COMMERCIAL		MOTORCYCLE		TOTAL	
NUMBER OF RECORDS	1394		555		91		2040	
NUMBER USEABLE	1353		539		87		1979	
TOTAL PAYMENT	PRIVATE PASSENGER		COMMERCIAL		MOTORCYCLE		WEIGHTED	
	%\$	%claimants	%\$	%claimants	%\$	%claimants	%\$	%claimants
LESS THAN \$1,000	1.5	28.5	0.6	17.8	0.8	31.0	1.4	27.
\$1,001 TO \$2,000	2.1	12.7	1.5	14.5	0.8	9.2	2.0	12.
\$2,001 TO \$3,000	2.8	10.7	1.6	8.3	0.8	5.7	2.7	10.
\$3,001 TO \$4,000	2.4	6.4	2.5	9.5	0.9	4.6	2.3	6.
\$4,001 TO \$5,000	2.7	5.7	1.7	5.2	0.0	0.0	2.6	5.
\$5,001 TO \$6,000	2.9	5.0	1.6	4.1	1.4	4.6	2.8	4.
\$6,001 TO \$7,000	2.8	4.1	2.3	4.8	0.4	1.1	2.7	4.
\$7,001 TO \$8,000	1.6	2.0	2.4	4.3	0.5	1.1	1.6	2.
\$8,001 TO \$9,000	2.3	2.6	1.9	3.0	1.1	2.3	2.2	2.
\$9,001 TO \$10,000	2.6	2.6	2.0	2.8	2.5	4.6	2.6	2.
\$10,001 TO \$15,000	10.5	8.1	6.8	7.6	5.6	8.0	10.1	8.
\$15,001 TO \$20,000	6.8	3.7	4.7	3.7	3.3	3.4	6.7	3.
\$20,001 TO \$25,000	3.3	1.4	5.3	3.3	4.4	3.4	3.4	1.
\$25,001 TO \$50,000	15.7	4.1	16.0	5.9	23.8	12.6	15.8	4.
\$50,001 TO \$75,000	6.0	0.9	9.4	2.0	11.1	3.4	6.3	1.
\$75,001 TO \$100,000	5.9	0.7	5.8	0.9	11.9	2.3	5.9	0.
\$100,001 TO \$200,000	8.0	0.5	19.6	1.7	9.0	1.1	8.8	0.
\$200,001 TO \$300,000	5.7	0.2	3.1	0.2	0.0	0.0	5.4	0.
\$300,001 TO \$400,000	8.6	0.2	4.2	0.2	21.6	1.1	8.4	0.
\$400,001 TO \$500,000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.
MORE THAN \$500,000	5.9	0.1	7.0	0.2	0.0	0.0	6.0	0.

Note1 : "%\$" means percentage of total dollars paid to claimants in each band.

Note2 : "%claimants" means percentage of claimants in each band.

QUESTION 30

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	1394	555	91	2040

BREAKDOWN OF SETTLEMENT/AWARD	PRIVATE PASSENGER % total \$	COMMERCIAL % total \$	MOTORCYCLE % total \$	WEIGHTED % total \$
LOSS OF EMPLOYMENT INCOME	13.5	11.3	10.8	13.3
OTHER SPECIAL DAMAGES	2.5	2.8	1.1	2.5
NON-PECUNIARY	45.9	41.3	46.0	45.6
LRA/FLA	4.8	13.3	3.6	5.4
FUTURE EMPLOYMENT INCOME	10.3	7.6	14.1	10.1
FUTURE CARE	1.4	2.5	0.0	1.4
ROSS-UP FOR TAX	0.4	0.6	0.0	0.4
FUND MANAGEMENT	0.0	0.0	0.0	0.0
PARTY AND PARTY COSTS	11.0	10.8	11.0	11.0
REJUDGEMENT INTEREST	10.2	9.9	13.4	10.2

note1 : "% total \$" means percentage of total B.I. dollars.

BREAKDOWN OF SETTLEMENT/AWARD	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
LOSS OF EMPLOYMENT INCOME	38.4	38.6	41.8	38.4
OTHER SPECIAL DAMAGES	22.4	30.5	31.9	23.0
NON-PECUNIARY	94.6	93.5	86.8	94.5
LRA/FLA	8.3	11.7	16.5	8.6
FUTURE EMPLOYMENT INCOME	2.2	2.9	5.5	2.2
FUTURE CARE	0.2	0.7	0.0	0.2
ROSS-UP FOR TAX	0.1	0.2	0.0	0.1
FUND MANAGEMENT	0.0	0.0	0.0	0.0
PARTY AND PARTY COSTS	53.8	62.3	50.5	54.4
REJUDGEMENT INTEREST	37.2	42.7	40.7	37.6

note1 : "%claimants" means percentage of total claimants receiving each head of damages.

QUESTION 31

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	1394	555	91	2040

FLRA/FLA CLAIMS	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
SPOUSE	1.5	7.0	0.3	1.9
CHILDREN	0.8	3.7	0.4	1.0
OTHERS	2.5	2.6	2.9	2.5

QUESTION 32

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	1394	555	91	2040

BREAKDOWN OF INTERNAL EXPENSES	PRIVATE PASSENGER % total \$	COMMERCIAL % total \$	MOTORCYCLE % total \$	WEIGHTED % total \$
FEES PAID TO INSURER'S LAWYER	6.0	8.4	7.4	6.2
FEES ALLOCATED TO IN-HOUSE LAWYER	0.2	0.1	0.0	0.2
COST OF INDEPENDANT ADJUSTER	2.0	1.7	1.3	2.0
COST OF DEFENCE MEDICAL	0.2	0.2	0.3	0.2
COST OF OTHER EXPERTS	0.7	0.7	0.3	0.7
OTHER	0.4	1.1	0.3	0.5

Note1 : "% total \$" means percentage of total B.I. dollars.

QUESTION 36

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	1394	555	91	2040

TIME TILL MEDICAL REPORT	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
LESS THAN ONE MONTH	7.7	9.0	14.3	7.9
TO 2 MONTHS	6.5	7.0	4.4	6.5
TO 3 MONTHS	7.4	3.1	8.8	7.1
TO 4 MONTHS	5.2	6.3	5.5	5.2
TO 5 MONTHS	4.0	4.7	5.5	4.1
TO 6 MONTHS	3.8	3.6	6.6	3.8
TO 9 MONTHS	9.1	11.9	5.5	9.3
TO 12 MONTHS	7.5	9.4	2.2	7.5
TO 24 MONTHS	14.7	15.7	16.5	14.8
TO 36 MONTHS	4.2	5.4	5.5	4.3
TO 48 MONTHS	0.5	0.9	0.0	0.5
TO 60 MONTHS	0.1	0.4	1.1	0.1
MORE THAN 60 MONTHS	0.1	0.0	0.0	0.1
TIME RECEIVED	29.3	22.7	24.2	28.8

DIAN LOSS (IN WEEKS) excluding permanent	7.0	8.0	5.0	7.1
--	-----	-----	-----	-----

QUESTION 37

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	1394	555	91	2040

ADDITIONAL INFORMATION	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
REPRESENTED BY COUNSEL	53.9	67.6	52.7	54.8
ACTION COMMENCED	23.3	33.3	35.2	24.1
EXAMINATION FOR DISCOVERY	12.3	18.7	19.8	12.8
CASE PRE-TRIED	4.2	7.6	9.9	4.5
CASE TRIED BY JURY	0.2	0.2	1.1	0.2
CASE APPEALED	0.1	0.2	0.0	0.1
APPEALED BY PLAINTIFF	0.0	0.2	0.0	0.0

Note: "% claimants" does not add to 100% as the events are not independant.

QUESTION 38

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1394	555	91	2040
NUMBER USEABLE	1385	539	90	2014
SETTLEMENT CONCLUDED	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
BEFORE ACTION COMMENCED	76.8	66.8	64.4	76.0
BEFORE DISCOVERY EXAMINATION	10.7	14.8	14.4	11.0
BEFORE PRE-TRIAL	8.2	10.9	10.0	8.4
WITHIN 10 DAYS OF/AT PRE-TRIAL	0.7	2.6	3.3	0.9
BEFORE ACTION CALLED FOR TRIAL	3.0	4.3	5.6	3.1
AT TRIAL	0.6	0.6	2.2	0.6

YELLOW FORM

General Instructions

1. Indicate company number, your initials and claim number clearly for future reference.
2. This survey form is to be completed for each claimant. For example, if an accident gives rise to three claimants, three separate forms have to be completed.
3. All dollar figures are in whole dollars. Absolutely no cent should be shown.
4. All dollar figures which should balance to the answers of other questions will be checked.
5. All dates are in international convention. They are shown as year, month and day.
6. Do not leave date blank. Use UN for unknown only if the information is unavailable.
7. Where a dollar amount is expected, a blank will imply 0. If there is no information to make an estimate, use UN for unknown.
8. Where a check mark "X" or a selection "a number" is expected, you MUST pick the most appropriate category. Otherwise, the form will be returned.

10 March 1987

- [illegible]

- [13] IBC statistical territory code 17 of your insured vehicle.
- [14] Place of accident (check one box) Ontario Quebec
 other jurisdictions in Canada U.S.A.
- [15] IBC class code
- [16] Date of accident YY 1 9 MM DD
- [17] Date when an accident benefit payment or reserve was set up (whichever is earlier) YY 1 9 MM DD
- [18] Date of first payment to claimant
YY 1 9 MM DD
- [19] Amount of first payment to claimant \$

Answer questions 20 and 21 if the claim is uninsured motorist coverage or the accident benefit claim is in dispute or litigation.

- [20] First verbal offer to settle was made by claimant/representative
 your company neither party (i.e. no verbal offer was made)
Date of first verbal offer to settle
YY 1 9 MM DD
- [21] First written offer to settle was made by claimant/representative
 your company neither party (i.e. no written offer was made)
Date of the first written offer to settle
YY 1 9 MM DD

[22] Date of settlement (i.e. last payment to claimant)

YY 1 9 MM DD

If claim is still outstanding, check here.

[23] Condition of claimant 1: deceased 2: injured

[24] Type of injury (Check more than one if necessary)

INSTRUCTION: first check the part(s) of the body injured, then check the type(s) of injury corresponding to the part of the body.

Part of Body	Description of Injury
<u> </u> <u> </u> 99 none	<u> </u> <u> </u> nominal value (shaken up) <u> </u> <u> </u> psychological trauma
<u> </u> <u> </u> 0 brain or spinal column	<u> </u> <u> </u> paraplegic or quadraplegic or vegetative state <u> </u> <u> </u> other
<u> </u> <u> </u> 1 head	<u> </u> <u> </u> fracture <u> </u> <u> </u> concussion
<u> </u> <u> </u> 2 face	<u> </u> <u> </u> fracture <u> </u> <u> </u> laceration with scar <u> </u> <u> </u> laceration - no scar
<u> </u> <u> </u> 3 eye	<u> </u> <u> </u> partial loss or loss of use of 1 or 2 eyes <u> </u> <u> </u> total loss or loss of use of 1 or 2 eyes
<u> </u> <u> </u> 4 ears	<u> </u> <u> </u> partial loss or loss of use of 1 or 2 ears <u> </u> <u> </u> total loss or loss of use of 1 or 2 ears
<u> </u> <u> </u> 5 nose	<u> </u> <u> </u> resulting in disfigurement <u> </u> <u> </u> no disfigurement
<u> </u> <u> </u> 6 teeth and jaw	<u> </u> <u> </u> fracture <u> </u> <u> </u> loss of teeth <u> </u> <u> </u> other
<u> </u> <u> </u> 7 voice and larynx	<u> </u> <u> </u> loss of voice <u> </u> <u> </u> other

☐ 8 neck ☐ soft tissue ☐ vertebrae/disc fracture
 ☐ psychological trauma

☐ 9 back ☐ soft tissue ☐ vertebrae/disc fracture
 ☐ psychological trauma

<u>Part of Body</u>	<u>Description of Injury</u>
<input type="checkbox"/> 10 chest and ribs	<input type="checkbox"/> fracture <input type="checkbox"/> other
<input type="checkbox"/> 11 internal organs	<input type="checkbox"/> surgery is required <input type="checkbox"/> other
<input type="checkbox"/> 12 shoulder	<input type="checkbox"/> soft tissue <input type="checkbox"/> fracture <input type="checkbox"/> laceration <input type="checkbox"/> other
<input type="checkbox"/> 13 arm and hand	<input type="checkbox"/> fracture <input type="checkbox"/> loss of arm or hand <input type="checkbox"/> loss of both arms or hands <input type="checkbox"/> laceration <input type="checkbox"/> loss of fingers <input type="checkbox"/> other
<input type="checkbox"/> 14 elbow	<input type="checkbox"/> fracture <input type="checkbox"/> other
<input type="checkbox"/> 15 wrist	<input type="checkbox"/> fracture <input type="checkbox"/> other
<input type="checkbox"/> 16 pelvis and hip	<input type="checkbox"/> fracture <input type="checkbox"/> other
<input type="checkbox"/> 17 leg and foot	<input type="checkbox"/> fracture <input type="checkbox"/> loss of leg or foot <input type="checkbox"/> laceration <input type="checkbox"/> loss of both legs or feet <input type="checkbox"/> other
<input type="checkbox"/> 18 knee	<input type="checkbox"/> soft tissue <input type="checkbox"/> fracture <input type="checkbox"/> other
<input type="checkbox"/> 19 ankle	<input type="checkbox"/> fracture <input type="checkbox"/> other

[25] Employment 1: employed 4: retired 7: preschooler
 2: homemaker 5: unemployed 8: other
 3: student 6: employed part-time

[26] Type of employment 1: self-employed 3: clerical
 2: managerial/professional 4: manual

[27] Gross employment income (weekly) \$

[28] Amount of actual time loss Yrs. Mos. Weeks
including intermittent time off. Use your best estimate here, do not leave
it blank.

[29] Total gross amount of payment to claimant and outstanding reserve (including
uninsured motorist coverage) \$ This amount must
equal to the sum of question 30 and 34.

[30] Section B benefits	Payments	Reserve
medical	\$ <u> </u>	\$ <u> </u>
rehabilitation	\$ <u> </u>	\$ <u> </u>
disability	\$ <u> </u>	\$ <u> </u>
housewife disability benefit	\$ <u> </u>	\$ <u> </u>
funeral	\$ <u> </u>	\$ <u> </u>
death	\$ <u> </u>	\$ <u> </u>
Quebec Part III	\$ <u> </u>	\$ <u> </u>
total	\$ <u> </u>	\$ <u> </u>

[31] Employer salary continuance programs unknown
Sick leave with pay % salary , \$
Short term disability % salary , \$
Long term disability % salary , \$

32] Government programs unknown

U.I.C.	\$	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
C.P.P.	\$	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Workers' Compensation	\$	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Other	\$	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

33] Additional information (check yes or no):

	YES	NO
(a) Was claimant represented by counsel?	<u> </u>	<u> </u>
(b) Was action commenced?	<u> </u>	<u> </u>
(c) Was there examination for discovery?	<u> </u>	<u> </u>
(d) Was case pre-tried?	<u> </u>	<u> </u>
(e) Was case tried by jury?	<u> </u>	<u> </u>
(f) Was there an appeal?	<u> </u>	<u> </u>
(g) If appealed, was case appealed by plaintiff?	<u> </u>	<u> </u>
(h) Was claim settled by arbitration?	<u> </u>	<u> </u>

Answer the rest of the questions only when there are B.I. uninsured motorist payments or reserve.

34] Total gross amount of payment to claimant and reserve, including costs, disbursements and prejudgement interest \$ This amount MUST equal to the sum of 35 (a), (b), (c) and (d).

35] Settlement, or breakdown of award if case tried:

(a) Special damages (net of Section B):

	Payments	Reserve
loss of employment		
income to trial or		
settlement	\$ <u> </u>	\$ <u> </u>
other income loss	\$ <u> </u>	\$ <u> </u>
medical and hospital		
(above OHIP)	\$ <u> </u>	\$ <u> </u>

funeral expense	\$	_ _ _ _ _ _ _	\$	_ _ _ _ _ _ _
other	\$	_ _ _ _ _ _ _	\$	_ _ _ _ _ _ _
sub-total	\$	_ _ _ _ _ _ _	\$	_ _ _ _ _ _ _

(b) General damages (net of Section B if applicable):

	Payments	Reserve
non-pecuniary	\$ _ _ _ _ _ _ _	\$ _ _ _ _ _ _ _
FLRA/FLA [must equal		
36 (a) + (b) +(c)]	\$ _ _ _ _ _ _ _	\$ _ _ _ _ _ _ _
future employment income	\$ _ _ _ _ _ _ _	\$ _ _ _ _ _ _ _
future care	\$ _ _ _ _ _ _ _	\$ _ _ _ _ _ _ _
gross-up for tax	\$ _ _ _ _ _ _ _	\$ _ _ _ _ _ _ _
fund management	\$ _ _ _ _ _ _ _	\$ _ _ _ _ _ _ _
sub-total	\$ _ _ _ _ _ _ _	\$ _ _ _ _ _ _ _

(c) Party to party costs

including

disbursements	\$	_ _ _ _ _ _ _	\$	_ _ _ _ _ _ _
---------------	----	---------------	----	---------------

(d) Prejudgement interest	\$	_ _ _ _ _ _ _	\$	_ _ _ _ _ _ _
---------------------------	----	---------------	----	---------------

|_|_| stated in settlement

|_|_| estimated

[36] Family Law Reform Act/Family Law Act claims:

(a) Spouse:

Payments

Reserve

Amount paid	\$	_ _ _ _ _ _ _	\$	_ _ _ _ _ _ _
-------------	----	---------------	----	---------------

(b) Children:

Number of claimants	_ _ _
---------------------	-------

Number of claimants paid	_ _ _
--------------------------	-------

Amount paid	\$	_ _ _ _ _ _ _	\$	_ _ _ _ _ _ _
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(c) Other relatives and others:

Number of claimants

Number of claimants paid

Amount paid \$ \$

Breakdown of internal expenses (exclude staff adjuster):

(a) Fees paid to insurer's lawyer \$

(b) Fees allocated to in-house lawyer \$

(c) Cost of independent adjuster \$

(d) Cost of defence medical \$

(e) Cost of other experts \$

(f) Other \$

If claim settled, indicate when settlement was concluded (check only ONE):

(a) before action commenced

(b) after action commenced but before examination for discovery

(c) after examination for discovery but before pre-trial

(d) at pre-trial or as an immediate consequence of pre-trial

(e) between pre-trial and date action called for trial

(f) at trial

Did gross value of claim exceed policy limit? Yes No

If yes, what was the gross value \$ 0 0 0

Was the claim a structured settlement? Yes No

If yes, answer the following:

(a) gross amount of claim [from question 34] \$

(b) interim payments \$

(c) party to party costs [from 35 (c)] \$

(d) cost of annuity [must equal

40 (a) - (b) - (c)] \$

(e) brokerage fee or other fee (if known) \$

SUMMARY ANALYSIS OF MOTOR VEHICLE A.B. CLAIM SURVEY (YELLOW FORM)

QUESTION 6

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	890	338	191	1419
NUMBER USEABLE	884	337	191	1412
POLICY LIMIT OF INSURED	PRIVATE PASSENGER %accidents	COMMERCIAL %accidents	MOTORCYCLE %accidents	WEIGHTED %accidents
UP TO \$200,000	5.4	6.8	28.8	5.8
\$300,000	4.5	2.7	1.6	4.4
\$500,000	43.7	38.0	55.5	43.4
\$1,000,000	43.6	46.3	13.6	43.4
OVER \$1,000,000	2.8	6.2	0.5	3.0

QUESTION 7

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1138	406	210	1754
NUMBER USEABLE	1138	406	210	1754
CLAIMANT CATEGORY	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
DRIVER	61.4	60.6	83.8	61.4
SPOUSE OF DRIVER	8.6	5.7	1.4	8.6
DEPENDENT CHILD	1.8	0.7	0.5	1.8
PASSENGER (NOT NAMED INSURED)	21.2	20.9	10.5	21.2
PEDESTRIAN	5.6	11.1	2.4	6.0
OTHER	1.4	1.0	1.4	1.4

QUESTION 8

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1138	406	210	1754
NUMBER USEABLE	1137	404	210	1751
SEX OF CLAIMANT	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
MALE	47.8	65.6	87.1	49.4
FEMALE	52.2	34.4	12.9	50.6

QUESTION 9

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1138	406	210	1754
NUMBER USEABLE	1138	406	210	1754

AGE OF CLAIMANT	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
LESS THAN 16 YRS	7.2	4.7	6.7	7.0
16 TO 18 YRS	6.0	5.9	9.5	6.0
18 TO 20 YRS	6.7	7.6	15.2	6.8
20 TO 22 YRS	8.1	6.9	13.3	8.1
22 TO 24 YRS	8.7	4.7	13.8	8.5
24 TO 29 YRS	14.9	13.8	12.4	14.8
29 TO 34 YRS	9.1	15.8	11.4	9.5
34 TO 39 YRS	9.8	8.9	7.1	9.7
39 TO 44 YRS	6.3	8.1	3.3	6.4
44 TO 49 YRS	6.3	5.4	2.9	6.2
49 TO 54 YRS	4.5	7.4	1.9	4.7
54 TO 59 YRS	4.2	4.2	1.4	4.2
59 TO 64 YRS	4.0	3.7	1.0	4.0
64 TO 69 YRS	1.6	1.5	0.0	1.6
69 YRS AND MORE THAN 69 YRS	2.5	1.5	0.0	2.4

QUESTION 10

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	890	338	191	1419
NUMBER USEABLE	890	338	191	1419

TYPE OF ACCIDENT	PRIVATE PASSENGER %accidents	COMMERCIAL %accidents	MOTORCYCLE %accidents	WEIGHTED %accidents
SINGLE VEHICLE	19.6	25.7	40.8	20.2
MULTI VEHICLE	80.4	74.3	59.2	79.8

QUESTION 11

		PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS		890	338	191	1419
NUMBER USEABLE		821	109	180	1110
ACCIDENT VEHICLES		PRIVATE PASSENGER %accidents	COMMERCIAL %accidents	MOTORCYCLE %accidents	WEIGHTED %accidents
INSURED	OTHER				
CAR	- SINGLE VEHICLE	29.2	0.0	0.0	26.9
CAR	- CAR	61.0	0.0	0.0	56.1
CAR	- TRUCK	9.0	0.0	0.0	8.3
CAR	- MOTORCYCLE	0.1	0.0	0.0	0.1
CAR	- OTHER	0.6	0.0	0.0	0.6
INSURED	OTHER				
TRUCK	- SINGLE VEHICLE	0.0	48.6	0.0	3.4
TRUCK	- CAR	0.0	39.4	0.0	2.8
TRUCK	- MOTORCYCLE	0.0	11.0	0.0	0.8
TRUCK	- TRUCK	0.0	0.0	0.0	0.0
TRUCK	- OTHER	0.0	0.9	0.0	0.1
INSURED	OTHER				
MOTORCYCLE	- SINGLE VEHICLE	0.0	0.0	42.8	0.4
MOTORCYCLE	- CAR	0.0	0.0	36.1	0.4
MOTORCYCLE	- TRUCK	0.0	0.0	7.8	0.1
MOTORCYCLE	- MOTORCYCLE	0.0	0.0	13.3	0.1
MOTORCYCLE	- OTHER	0.0	0.0	0.0	0.0

QUESTION 12

		PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS		1138	406	210	1754
NUMBER USEABLE		1138	406	210	1754
DEGREE OF FAULT OF CLAIMANT		PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
NONE		77.7	75.1	49.5	77.2
LESS THAN 100%		5.0	7.1	5.2	5.2
100%		17.3	17.7	45.2	17.6

QUESTION 13

		PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS		890	338	191	1419
NUMBER USEABLE		886	338	190	1414
IBC STATISTICAL TERRITORY		PRIVATE PASSENGER %accidents	COMMERCIAL %accidents	MOTORCYCLE %accidents	WEIGHTED %accidents
METRO TORONTO		39.4	33.1	7.9	38.6
URBAN (NOT TORONTO)		32.1	32.2	47.9	32.2
RURAL		28.6	34.6	44.2	29.1

QUESTION 14

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	890	338	191	1419
NUMBER USEABLE	890	338	191	1419
	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	WEIGHTED
PLACE OF ACCIDENT	%accidents	%accidents	%accidents	%accidents
ONTARIO	97.9	98.2	96.9	97.9
QUEBEC	0.8	0.6	0.5	0.8
OTHER PROVINCES	0.0	0.6	0.5	0.0
ALASKA	1.3	0.6	2.1	1.3

QUESTION 18

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1138	406	210	1754
NUMBER USEABLE	1069	385	205	1659
	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	WEIGHTED
TIME TILL FIRST PAYMENT	%claimants	%claimants	%claimants	%claimants
WITHIN ONE MONTH	34.5	36.6	48.8	34.8
TO 2 MONTHS	22.7	26.0	20.0	22.9
TO 3 MONTHS	12.3	10.9	6.8	12.2
TO 4 MONTHS	7.2	8.1	6.3	7.3
TO 5 MONTHS	5.1	4.2	3.9	5.1
TO 6 MONTHS	4.5	2.9	3.4	4.4
TO 9 MONTHS	6.3	3.6	5.4	6.1
TO 12 MONTHS	3.6	4.4	2.4	3.7
2 TO 24 MONTHS	3.6	3.4	2.9	3.6
6 TO 36 MONTHS	0.0	0.0	0.0	0.0
6 TO 48 MONTHS	0.0	0.0	0.0	0.0
3 TO 60 MONTHS	0.0	0.0	0.0	0.0
MORE THAN 60 MONTHS	0.0	0.0	0.0	0.0
MEDIAN (IN MONTHS)	4.0	4.0	3.0	4.0

QUESTION 22

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1138	406	210	1754
NUMBER USEABLE	943	355	200	1498
TIME TILL LAST PAYMENT TO CLAIMANT	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
WITHIN ONE MONTH	16.9	16.1	24.5	16.9
1 TO 2 MONTHS	15.9	16.6	14.5	15.9
2 TO 3 MONTHS	10.4	11.5	12.5	10.5
3 TO 4 MONTHS	7.7	11.3	11.0	8.0
4 TO 5 MONTHS	7.4	6.8	6.5	7.4
5 TO 6 MONTHS	6.4	5.1	5.0	6.3
6 TO 9 MONTHS	12.9	11.3	8.5	12.8
9 TO 12 MONTHS	8.2	9.9	9.5	8.3
12 TO 24 MONTHS	14.0	11.3	8.0	13.7
24 TO 36 MONTHS	0.2	0.3	0.0	0.2
36 TO 48 MONTHS	0.0	0.0	0.0	0.0
48 TO 60 MONTHS	0.0	0.0	0.0	0.0
MORE THAN 60 MONTHS	0.0	0.0	0.0	0.0
MEDIAN (IN MONTHS)	4.0	4.0	3.0	4.0

QUESTION 23

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1138	406	210	1754
NUMBER USEABLE	1138	406	210	1754
CONDITION OF CLAIMANT	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
DECEASED	1.3	4.2	7.6	1.3
INJURED	98.7	95.8	92.4	98.7

QUESTION 24

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1138	406	210	1754
NUMBER USEABLE	1138	406	210	1754
	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
TYPE OF INJURY	%claimants	%claimants	%claimants	%claimants
HEAD				
CONCUSSIONAL VALUE (SHAKEN UP)	8.1	6.2	5.2	7.9
PSYCHOLOGICAL TRAUMA	0.5	0.2	0.0	0.5
SKULL FRACTURE				
FRONTAL OR SPINAL COLUMN				
PARAPLEGIC, QUADRAPLEGIC OR VEGETATIVE STATE	0.2	0.2	0.0	0.2
OTHER	1.1	0.5	1.4	1.0
NECK				
CONCUSSION				
FRAC				
FRAC				
CONCUSSION	0.8	1.2	0.5	0.8
CONCUSSION	7.1	7.4	2.9	7.1
FACE				
FRAC				
FRAC				
SCAR				
SCAR				
SCAR				
SCAR	0.7	0.5	0.5	0.7
SCAR	2.3	3.0	1.9	2.3
SCAR	4.4	4.2	3.8	4.4
EYES				
LOSS OR LOSS OF USE OF 1 OR 2 EYES	0.1	0.2	0.5	0.1
LOSS OR LOSS OF USE OF 1 OR 2 EYES	0.1	0.0	0.0	0.1
EARS				
LOSS OR LOSS OF USE OF 1 OR 2 EARS	0.1	0.0	0.0	0.1
LOSS OR LOSS OF USE OF 1 OR 2 EARS	0.0	0.2	0.0	0.0
NOSE				
DISFIGUREMENT	0.2	0.0	0.0	0.2
DISFIGUREMENT	1.5	2.5	0.5	1.6
TEETH AND JAW				
FRAC				
FRAC				
FRAC				
FRAC	0.8	0.5	1.4	0.8
FRAC	0.7	1.7	0.5	0.8
FRAC	2.8	2.0	2.4	2.7
VOICE AND LARYNX				
LOSS OF VOICE	0.0	0.0	0.0	0.0
OTHER	0.1	0.2	0.0	0.1
BACK				
SOFT TISSUE	57.9	50.7	5.7	56.9
VERTABRAE/DISC FRACTURE	0.2	0.5	1.0	0.2
PSYCHOLOGICAL TRAUMA	1.8	1.2	0.0	1.7
NECK				
SOFT TISSUE	39.1	31.5	11.0	38.3
VERTABRAE/DISC FRACTURE	1.1	0.7	3.3	1.1
PSYCHOLOGICAL TRAUMA	1.1	1.0	0.0	1.0
CHEST AND RIBS				
FRAC				
FRAC				
FRAC				
FRAC	3.3	3.2	4.3	3.3
FRAC	5.5	8.4	3.8	5.7

QUESTION 24 continued

TYPE OF INJURY	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
INTERNAL ORGANS				
SURGERY IS REQUIRED	0.9	1.0	0.5	0.9
OTHER	1.3	1.2	2.9	1.3
SHOULDER				
SOFT TISSUE	10.5	9.1	6.2	10.3
FRACTURE	1.5	2.0	6.2	1.6
LACERATION	0.2	0.2	0.5	0.2
OTHER	0.7	1.0	1.4	0.7
ARM AND HAND				
FRACTURE	1.7	0.7	9.0	1.7
LOSS OF ARM OR HAND	0.0	0.0	0.0	0.0
LOSS OF BOTH ARMS OR HANDS	0.0	0.0	0.0	0.0
LACERATION	1.9	2.5	6.7	2.0
LOSS OF FINGERS	0.0	0.2	0.0	0.0
OTHER	3.5	4.9	3.8	3.6
ELBOW				
FRACTURE	0.4	0.2	1.4	0.4
OTHER	2.0	2.2	6.2	2.1
WRIST				
FRACTURE	0.4	1.0	6.7	0.5
OTHER	1.1	1.5	2.4	1.1
PELVIS AND HIP				
FRACTURE	1.8	2.7	3.3	1.9
OTHER	2.3	2.5	5.2	2.3
LEG AND FOOT				
FRACTURE	3.0	4.9	10.5	3.2
LOSS OF LEG OR FOOT	0.0	0.0	0.5	0.0
LACERATION	1.1	3.0	7.6	1.3
LOSS OF BOTH LEGS OR FEET	0.0	0.0	0.0	0.0
OTHER	4.5	6.7	10.5	4.7
KNEE				
SOFT TISSUE	6.0	6.7	9.0	6.1
FRACTURE	0.3	1.0	2.9	0.3
OTHER	1.4	1.7	8.1	1.5
ANKLE				
FRACTURE	0.7	0.2	1.4	0.7
OTHER	1.3	3.0	9.0	1.3

QUESTION 25

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1138	406	210	1754
NUMBER USEABLE	1078	384	200	1662
EMPLOYMENT	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
EMPLOYED	72.2	77.3	75.5	72.6
MANUFACTURER	7.8	6.3	1.0	7.6
IDENT	6.3	6.0	6.0	6.3
TIRED	3.5	1.3	1.5	3.3
EMPLOYED	4.7	3.1	5.5	4.6
EMPLOYED PARTTIME	4.7	5.2	8.5	4.8
SCHOOLER	0.3	0.3	0.5	0.3
IER	0.5	0.5	1.5	0.5

QUESTION 26

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1078	384	200	1662
NUMBER USEABLE	913	338	181	1432
EMPLOYMENT TYPE	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
SELF EMPLOYED	11.3	19.2	6.6	11.8
MANAGERIAL/PROFESSIONAL	13.6	8.6	5.5	13.2
CLERICAL	19.1	13.3	4.4	18.5
QUAL	56.1	58.9	83.4	56.5

QUESTION 27

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	913	338	181	1432
NUMBER USEABLE	734	295	159	1188
GROSS WEEKLY EMPLOYMENT INCOME	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimant
LESS THAN \$200	23.4	21.0	19.5	23.2
\$201 TO \$300	23.2	19.7	22.0	22.9
\$301 TO \$400	19.1	18.0	17.6	19.0
\$401 TO \$500	12.9	17.3	12.6	13.2
\$501 TO \$600	9.7	12.9	15.1	10.0
\$601 TO \$700	5.9	4.4	7.5	5.8
\$701 TO \$800	2.5	2.7	3.8	2.5
\$801 TO \$900	1.0	2.0	0.6	1.0
\$901 TO \$1000	0.7	0.7	0.0	0.7
MORE THAN \$1000	1.8	1.4	1.3	1.7
AVERAGE \$	373.22	394.72	387.58	374.87

QUESTION 28

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1138	406	210	1754
NUMBER USEABLE	786	308	163	1257

QUAL TIME LOSS	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
WEEK	17.3	13.0	15.3	17.0
WEEKS	14.4	11.7	15.3	14.2
WEEKS	4.7	6.8	4.3	4.9
WEEKS	7.3	6.8	6.1	7.2
MONTHS	12.1	12.0	16.0	12.1
MONTHS	10.4	14.3	13.5	10.7
MONTHS	5.3	8.1	11.0	5.6
MONTHS	6.0	5.2	2.5	5.9
MONTHS	5.0	3.2	1.2	4.8
MONTHS	3.1	3.9	2.5	3.1
MONTHS	2.3	1.9	1.2	2.3
MONTHS	1.4	1.6	2.5	1.4
MONTHS	1.1	1.3	1.8	1.2
MONTHS	1.3	1.6	0.0	1.3
MONTHS	0.3	1.0	0.0	0.3
YEARS	7.4	6.2	4.9	7.3
YEARS	0.8	1.0	1.2	0.8
YEARS	0.0	0.0	0.0	0.0
YEARS	0.0	0.0	0.0	0.0
PERMANENT	0.0	0.3	0.6	0.0
AGE LOSS (IN WEEKS) perm=5yrs	15.6	16.4	15.3	15.6
AGE LOSS (IN WEEKS) perm=20yrs	15.6	18.9	20.1	15.9
AGE LOSS (IN WEEKS) excluding permanent	6.0	8.0	7.0	6.2

e1: In calculating average, "perm=5yrs" means permanent disabilities are considered to be a 5 year loss.
e2: In calculating average "perm=20yrs" means permanent disabilities are considered to be a 20 year loss.

QUESTION 29

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1138	406	210	1754
NUMBER USEABLE	1136	402	209	1747

TOTAL PAYMENT	PRIVATE PASSENGER		COMMERCIAL		MOTORCYCLE		WEIGHTED	
	%\$	%claimants	%\$	%claimants	%\$	%claimants	%\$	%claimants
LESS THAN \$1,000	6.8	60.3	7.2	60.2	8.0	57.4	6.8	60.3
\$1,001 TO \$2,000	7.6	13.7	6.9	13.9	10.2	17.2	7.5	13.8
\$2,001 TO \$3,000	7.4	7.7	5.0	5.7	9.5	9.6	7.3	7.5
\$3,001 TO \$4,000	5.6	4.1	5.9	4.7	3.3	2.4	5.6	4.2
\$4,001 TO \$5,000	4.0	2.3	5.8	3.7	3.5	1.9	4.1	2.4
\$5,001 TO \$6,000	4.9	2.3	6.3	3.2	2.2	1.0	5.0	2.3
\$6,001 TO \$7,000	2.7	1.1	2.3	1.0	2.6	1.0	2.7	1.1
\$7,001 TO \$8,000	3.0	1.1	1.9	0.7	0.0	0.0	2.9	1.0
\$8,001 TO \$9,000	2.9	0.9	0.0	0.0	1.7	0.5	2.7	0.8
\$9,001 TO \$10,000	3.9	1.1	1.7	0.5	3.9	1.0	3.8	1.0
\$10,001 TO \$15,000	13.4	2.9	15.6	3.5	24.0	4.8	13.6	3.0
\$15,001 TO \$20,000	8.4	1.2	6.4	1.0	9.8	1.4	8.3	1.2
\$20,001 TO \$25,000	3.0	0.4	0.0	0.0	4.0	0.5	2.8	0.3
\$25,001 TO \$50,000	7.3	0.6	13.3	1.2	17.3	1.4	7.8	0.7
\$50,001 TO \$75,000	6.6	0.3	5.4	0.2	0.0	0.0	6.4	0.3
\$75,001 TO \$100,000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
\$100,001 TO \$200,000	4.1	0.1	16.4	0.2	0.0	0.0	4.9	0.1
\$200,001 TO \$300,000	8.4	0.1	0.0	0.0	0.0	0.0	7.7	0.1
\$300,001 TO \$400,000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
\$400,001 TO \$500,000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MORE THAN \$500,000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note1: "%\$" means percentage of total dollars paid to claimants in each band.
 Note2: "%claimants" means percentage of claimants in each band.

QUESTION 30

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1138	406	210	1754
NUMBER USEABLE	1123	394	209	1726

SECTION B BENEFITS	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	WEIGHTED	WEIGHTED
	%claimants	%claimants	%claimants	%claimants	AVERAGE
MEDICAL	70.1	66.8	60.3	69.7	641
REHABILITATION	1.9	2.0	3.3	1.9	2,701
DISABILITY	63.6	69.3	70.3	64.0	2,089
HOUSEWIFE DISABILITY BENEFIT	2.8	3.0	0.5	2.8	606
FUNERAL	1.2	2.0	5.7	1.3	995
DEATH	1.0	1.5	3.3	1.0	9,497
QUEBEC PART III	0.4	0.8	0.5	0.5	18,834

\$AM0

QUESTION 31

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1138	406	210	1754
NUMBER USEABLE	413	170	95	678
EMPLOYER SALARY CONTINUANCE PROGRAMS	PRIVATE PASSENGER %wage loss	COMMERCIAL %wage loss	MOTORCYCLE %wage loss	WEIGHTED %wage loss
LONG LEAVE WITH PAY	39.9	11.6	85.1	38.4
SHORT TERM DISABILITY	13.2	19.4	18.1	13.7
LONG TERM DISABILITY	0.4	8.4	8.4	1.0

note1: "%wage loss" means percentage of total dollars represented by the salary continuance program.

QUESTION 32

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1138	406	210	1754
NUMBER USEABLE	15	8	5	28
GOVERNMENT PROGRAMS	PRIVATE PASSENGER %wage loss	COMMERCIAL %wage loss	MOTORCYCLE %wage loss	WEIGHTED %wage loss
U.S.C.	38.2	32.4	54.8	38.0

note1: "%wage loss" means percentage of total dollars represented by the government program.
note2: CPP and Workers Compensation were not included in the analysis due to insufficient information.

QUESTION 33

	PRIVATE PASSENGER	COMMERCIAL	MOTORCYCLE	TOTAL
NUMBER OF RECORDS	1138	406	210	1754
NUMBER USEABLE	1138	406	210	1754
ADDITIONAL INFORMATION	PRIVATE PASSENGER %claimants	COMMERCIAL %claimants	MOTORCYCLE %claimants	WEIGHTED %claimants
DEFENDANT REPRESENTED BY COUNSEL	38.3	39.9	23.8	38.3
ACTION COMMENCED	4.7	6.2	0.5	4.7
DISCOVERY FOR DISCOVERY	0.8	1.5	0.5	0.8
BEFORE PRE-TRIED	0.0	0.2	0.0	0.0
BEFORE TRIED BY JURY	0.0	0.0	0.0	0.0
BEFORE APPEALED	0.0	0.0	0.0	0.0
BEFORE APPEALED BY PLAINTIFF	0.0	0.0	0.0	0.0
BEFORE TRIED BY ARBITRATION	0.1	0.0	0.0	0.1

QUESTION 34

	PRIVATE PASSENGER		COMMERCIAL		MOTORCYCLE		TOTAL	
NUMBER OF RECORDS	1138		406		210		1754	
NUMBER USEABLE	37		12		3		52	
TOTAL U.M. PAYMENT	PRIVATE PASSENGER		COMMERCIAL		MOTORCYCLE		WEIGHTED	
	%	%claimants	%	%claimants	%	%claimants	%	%claimants
LESS THAN \$1,000	0.5	10.8	0.4	16.7	0.0	0.0	0.5	1
\$1,001 TO \$2,000	0.5	5.4	0.0	0.0	10.2	33.3	0.5	5
\$2,001 TO \$3,000	0.7	5.4	0.9	8.3	13.5	33.3	0.9	5
\$3,001 TO \$4,000	0.6	2.7	0.0	0.0	0.0	0.0	0.6	2
\$4,001 TO \$5,000	1.5	5.4	0.0	0.0	0.0	0.0	1.4	5
\$5,001 TO \$6,000	0.0	0.0	1.9	8.3	0.0	0.0	0.1	0
\$6,001 TO \$7,000	2.2	5.4	0.0	0.0	0.0	0.0	2.0	0
\$7,001 TO \$8,000	1.3	2.7	0.0	0.0	0.0	0.0	1.2	0
\$8,001 TO \$9,000	4.1	8.1	0.0	0.0	0.0	0.0	3.8	0
\$9,001 TO \$10,000	12.4	21.6	0.0	0.0	0.0	0.0	11.4	1
\$10,001 TO \$15,000	9.7	13.5	15.4	33.3	76.3	33.3	10.7	1
\$15,001 TO \$20,000	2.5	2.7	11.9	16.7	0.0	0.0	3.2	0
\$20,001 TO \$25,000	3.9	2.7	0.0	0.0	0.0	0.0	3.6	0
\$25,001 TO \$50,000	13.6	8.1	16.3	8.3	0.0	0.0	13.7	0
\$50,001 TO \$75,000	9.4	2.7	0.0	0.0	0.0	0.0	8.7	0
\$75,001 TO \$100,000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
\$100,001 TO \$200,000	0.0	0.0	53.2	8.3	0.0	0.0	3.7	0
\$200,001 TO \$300,000	37.0	2.7	0.0	0.0	0.0	0.0	34.0	0
\$300,001 TO \$400,000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
\$400,001 TO \$500,000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
MORE THAN \$500,000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0

Note1: "%\$" means percentage of total dollars claimants in each band receive.
Note2: "%claimants" means percentage of claimants in each band.

QUESTION 37

	PRIVATE PASSENGER		COMMERCIAL		MOTORCYCLE		TOTAL	
NUMBER OF RECORDS	1138		406		210		1754	
NUMBER USEABLE	170		69		23		262	
BREAKDOWN OF INTERNAL EXPENSES	PRIVATE PASSENGER		COMMERCIAL		MOTORCYCLE		WEIGHTED	
	avg. size		avg. size		avg. size		avg. size	
FEES PAID TO INSURER'S LAWYER	438		2,022		100		546	
FEES ALLOCATED TO IN-HOUSE LAWYER	900		0		0		828	
COST OF INDEPENDANT ADJUSTER	626		556		670		622	
COST OF DEFENCE MEDICAL	311		429		822		324	
COST OF OTHER EXPERTS	485		476		391		483	
OTHER	356		352		279		355	

GREEN FORM

General Instructions

1. Indicate company number, your initials and claim number clearly for future reference.
2. This survey form is to be completed for each claimant. For example, if an accident gives rise to three claimants, three separate forms have to be completed.
3. All dollar figures are in whole dollars. Absolutely no cent should be shown.
4. All dollar figures which should balance to the answers of other questions will be checked.
5. All dates are in international convention. They are shown as year, month and day.
6. Do not leave date blank. Use UN for unknown only if the information is unavailable.
7. Where a dollar amount is expected, a blank will imply 0. If there is no information to make an estimate, use UN for unknown.
8. Where a check mark "X" or a selection "a number" is expected, you MUST pick the most appropriate category. Otherwise, the form will be returned.
9. Only claim files closed between April 13, 1987 and May 24, 1987 should be surveyed.

10. If a liability factor reduced the amount paid, please so indicate.

Ontario Automobile B.I. Claims Information Sheet

1. Company number (IBC code) |_|_|_|_|
2. Adjuster (initials) closing file |_|_|_|_|
3. Claim or File number |_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|_|
4. Claimant number |_|_|
5. Total amount paid on settlement or to satisfy judgment
 - (a) for the claim \$|_|_|_|_|_|_|_|_|_|_| [must equal
6(a) + 6(b) + 6(c) + 6(d)]
if this is not a structured
settlement
 - (b) for costs \$|_|_|_|_|_|_|_|_|_|_|
 - (c) total \$|_|_|_|_|_|_|_|_|_|_|
 - (d) Is this a structured settlement? |_| Yes |_| No
6. Of the total amount paid by settlement or judgment, how much was paid for
 - (a) prejudgment interest \$|_|_|_|_|_|_|_|_|_|_| [use 0 if none is paid]
(check one box) the above figure is stated in settlement |_|
the above figure is my estimate |_|
 - (b) Family Law Reform Act or Family Law Act claims \$|_|_|_|_|_|_|_|_|_|_|
Please allocate this sum in accordance with the relationship between
the claimant and the recipient

Spouse	\$ _ _ _ _ _ _ _ _ _ _	
Children	\$ _ _ _ _ _ _ _ _ _ _	Number _ _
Grandchildren	\$ _ _ _ _ _ _ _ _ _ _	Number _ _
Parents	\$ _ _ _ _ _ _ _ _ _ _	Number _ _
Grandparents	\$ _ _ _ _ _ _ _ _ _ _	Number _ _
Brother/Sister	\$ _ _ _ _ _ _ _ _ _ _	Number _ _
Other	\$ _ _ _ _ _ _ _ _ _ _	Number _ _
 - (c) Gross up \$|_|_|_|_|_|_|_|_|_|_|

any amount was paid in compensation because of the impact of taxation on a vital sum established for future care costs or in a fatal accident claim, please indicate what allocation was made in that regard.

- | | |
|---|----------------------|
| (d) Other | \$ _ _ _ _ _ _ _ _ _ |
| Loss of employment income to trial or settlement | \$ _ _ _ _ _ _ _ _ _ |
| Loss of future employment income | \$ _ _ _ _ _ _ _ _ _ |
| Out-of-pocket expense (incl. medical) | \$ _ _ _ _ _ _ _ _ _ |
| Future care expense | \$ _ _ _ _ _ _ _ _ _ |
| Non-pecuniary (other than FLA) | \$ _ _ _ _ _ _ _ _ _ |
| Other general damage (not specifically mentioned) | \$ _ _ _ _ _ _ _ _ _ |

Collateral Sources:

- (a) First-party accident and sickness insurance benefits paid for and received by claimant

1	1	NIL
---	---	-----

\$1,111,111, but not deducted from B.I. payment

\$111111, and deducted from B.I. payment

information not available to the B.I. insurer

- (b) Employer benefit schemes

1	1	NIL
---	---	-----

\$111111, but not deducted from B.I. payment

\$111111, and deducted from B.I. payment

information not available to the B.I. insurer

- (c) Government-based compensation schemes (such as Canada Pension, Unemployment Insurance, Family Benefits Act, etc.)

1	1	NIL
---	---	-----

\$1 1 1 1 1 1 1, but not deducted from B.I. payment

\$111111, and deducted from B.I. payment

information not available to the B.I. insurer

- (d) Disability income benefits from claimant's own automobile insurer

1	1	NIL
---	---	-----

\$111111, but not deducted from B.I. payment

\$ | | | | | | | , and deducted from B.I. payment

Does this accident involve a fatality or permanent disability?

	Yes	No
1. Do you have a job?		
2. Do you have a car?		
3. Do you have a house?		
4. Do you have a family?		
5. Do you have a pet?		
6. Do you have a garden?		
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82. Do you have a car?		
83. Do you have a house?		
84. Do you have a family?		
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90. Do you have a pet?		
91. Do you have a garden?		
92. Do you have a car?		
93. Do you have a house?		
94. Do you have a family?		
95. Do you have a pet?		
96. Do you have a garden?		
97. Do you have a car?		
98. Do you have a house?		
99. Do you have a family?		
100. Do you have a pet?		

Gross weekly wage \$ | | | | |

Actual time loss | | | YR | | | MO | | | DAYS

SUMMARIZED RESULTS FROM SUPPLEMENTARY B.I. CLAIMS SURVEY

TOTAL NUMBER OF CLAIMANTS 1646

TOTAL NUMBER OF CLAIMANTS WITH EMPLOYMENT INCOME 818

COLLATERAL SOURCES

	NOT DEDUCTED FROM BI PAYMENT	DEDUCTED FROM BI PAYMENT	NONE	NO INFO
	#	\$	#	#
FIRST-PARTY A/S	37	245,575	16	57,290
EMPLOYER	157	699,358	12	33,947
GOVERNMENT	24	66,014	14	46,148
DISABILITY INCOME	66	181,597	459	1,051,151
T O T A L		1,192,544		1,188,536

INDEMNITY FOR EMPLOYMENT INCOME LOSS TO TRIAL/SETTLEMENT	4220995
TOTAL INDEMNITY	6602075
TOTAL BEFORE TAX GROSS WAGES	6912729
TOTAL INDEMNITY IN EXCESS OF GROSS WAGES	-4.5%

SUMMARIZED RESULTS FROM SUPPLEMENTARY B.I. CLAIMS SURVEY

TOTAL NUMBER OF CLAIMANTS 1646

TOTAL NUMBER OF CLAIMANTS WITH EMPLOYMENT INCOME 818

TOTAL NUMBER OF CLAIMANTS WITH FULL INFORMATION 645

COLLATERAL SOURCES

	NOT DEDUCTED FROM BI PAYMENT		DEDUCTED FROM BI PAYMENT	
	#	\$	#	\$
FIRST-PARTY A/S INS BENEFITS	25	92,949	11	34,396
EMPLOYER BENEFITS	123	520,009	10	22,289
GOVERNMENT BENEFITS	22	54,507	14	46,148
DISABILITY INCOME BENEFITS	49	125,248	359	807,198
TOTAL		792,713		910,031

INDEMNITY FOR	
EMPLOYMENT INCOME LOSS	
NO TRIAL/SETTLEMENT	3049932
TOTAL INDEMNITY	4752676
TOTAL BEFORE TAX GROSS WAGES	4645869
TOTAL INDEMNITY IN EXCESS OF GROSS WAGES	2.3%

SUMMARIZED RESULTS FROM SUPPLEMENTARY B.I. CLAIMS SURV

TOTAL NUMBER OF CLAIMANTS 1646

TOTAL NUMBER OF CLAIMANTS WITH EMPLOYMENT INCOME 818

TOTAL NUMBER OF CLAIMANTS WITH FULL INFORMATION 645

NUMBER OF CLAIMANTS RECEIVING COLLATERAL BENEFITS 194

COLLATERAL SOURCES

	NOT DEDUCTED FROM BI PAYMENT		DEDUCTED FROM BI PAYMENT	
	#	\$	#	\$
FIRST-PARTY A/S INS BENEFITS	25	92,949	11	34,39
EMPLOYER BENEFITS	123	520,009	10	22,28
GOVERNMENT BENEFITS	22	54,507	14	46,14
DISABILITY INCOME BENEFITS	16	28,930	87	174,52
T O T A L		696,395		277,35

INDEMNITY FOR EMPLOYMENT INCOME LOSS TO TRIAL/SETTLEMENT	1042067
TOTAL INDEMNITY	2015815
TOTAL BEFORE TAX GROSS WAGES	1484006
TOTAL INDEMNITY IN EXCESS OF GROSS WAGES	35.8%

SUMMARIZED RESULTS FROM SUPPLEMENTARY B.I. CLAIMS SURVEY

TOTAL NUMBER OF CLAIMANTS 1646

TOTAL NUMBER OF CLAIMANTS WITH EMPLOYMENT INCOME 818

TOTAL NUMBER OF CLAIMANTS WITH FULL INFORMATION 645

NUMBER OF CLAIMANTS NOT RECEIVING COLLATERAL BENEFITS 451

COLLATERAL SOURCES

	NOT DEDUCTED FROM BI PAYMENT		DEDUCTED FROM BI PAYMENT	
	#	\$	#	\$
FIRST-PARTY A/S INS BENEFITS	0	0	0	0
EMPLOYER BENEFITS	0	0	0	0
GOVERNMENT BENEFITS	0	0	0	0
DISABILITY INCOME BENEFITS	33	96,318	272	632,678
TOTAL		96,318		632,678

INDEMNITY FOR EMPLOYMENT INCOME LOSS ON TRIAL/SETTLEMENT	2007865
TOTAL INDEMNITY	2736861
TOTAL BEFORE TAX GROSS WAGES	3161863
TOTAL INDEMNITY IN EXCESS OF GROSS WAGES	-13.4%

SUMMARIZED RESULTS FROM SUPPLEMENTARY B.I. CLAIMS SURVEY

NUMBER OF USEABLE RECORDS 337

FLRA/FLA CLAIMS	AMOUNT	NUMBER	%\$
SPOUSE	485,639	226	29.6
CHILDREN	288,754	238	17.6
GRANDCHILDREN	3,000	2	0.2
PARENTS	644,071	131	39.2
GRANDPARENTS	50,151	20	3.1
BROTHER/SUSTER	170,427	70	10.4
OTHER	500	1	0.0
TOTAL	1,642,542		100.0

REPORT ON THE CHANGE IN LOSS
COST AS A RESULT OF
CHANGES IN ACCIDENT BENEFITS AND
COMPENSATION ISSUES

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Introduction

We were retained by Mr. Justice Coulter A. Osborne, Commissioner of the Inquiry Into Motor Vehicle Accident Compensation in Ontario, to calculate the change in loss cost (per vehicle) that would result from the following proposals:

I. Accident Benefits

1. Medical and rehabilitation expenses up to \$500,000 per person with a time limit of 20 years less the age of the person or 10 years, whichever is longer.

Future care expense of \$500,000 per person with no time limit.

2. Death benefits on the death of the head of the household of \$25,000 and \$10,000 for each dependant other than the spouse.

Death benefit on the death of the spouse of the head of the household of \$25,000.

Death benefit of \$10,000 if a dependent child is killed in a motor vehicle accident.

3. Funeral expense of \$4,000 per person.

4. Disability

(A) Wage Earners

Disability income benefits for a wage earner are based on 80% of gross weekly wages less any employer benefits subject to the weekly maximum. The weekly benefit is indexed annually (by the Ontario CPI) up to 2 times the statutory weekly maximum on the date of the accident. The initial statutory weekly maximum is \$450.

(B) Students

Each student in grade 8 or lower will receive \$1,000 per school year lost. If disability continues beyond age 18, the student will receive a weekly benefit equal to 80% of the average industrial weekly wage

in Ontario on the date of the accident indexed to the date of payment.

Each student in grades 9 to 12 will receive \$2,000 per school year lost. If disability continues beyond age 18, the student will receive a weekly benefit equal to 80% of the average industrial weekly wage in Ontario on the date of the accident indexed to the date of payment.

Each student attending a post secondary institution will receive \$4,000 per school year lost. If disability continues beyond age 23, each will receive a weekly benefit equal to 80% of the average industrial weekly wage in Ontario on the date of the accident indexed to the date of payment.

There will be a 7 day deductible.

All government benefits are secondary to automobile benefits.

- (C) House care benefits:
Benefit is payable to a principal unpaid housekeeper who is disabled as a result of a motor vehicle accident. The maximum is \$50 per week. There is no time limit.
- (D) Child care benefits:
For the first 4 weeks of disability, the weekly benefit is \$150 plus \$50 per child up to a maximum of \$350 per week. If the homemaker is still disabled after 4 weeks, only actual and reasonable child care expenses incurred will be reimbursed. The maximum reimbursable expense is \$150 plus \$50 per child up to \$350 per week.

- 5. Quebec part III.
- 6. Uninsured motorist coverage.

II. Compensation Issues

- 1. Abolishing the collateral source rule with collateral benefits being deducted on an after tax basis.

2. Capping prejudgment interest on non-pecuniary loss to 3.5% per annum; interest on special damages is based on the Bank of Canada rate plus 1% per annum. Interest is compounded annually.
3. Any claim under \$10,000 will be tried in Small Claims Court first. No party and party costs will be allowed in this case.

III. Reduction in liability claim cost as an offset to accident benefit enhancements.

Conclusions

After analyzing the proposed benefits and their respective loss costs, we concluded that an overall savings will accrue to the automobile insurance system.

We estimated the reduction of claim cost to be approximately \$62 to \$70 million per year. If this savings is reflected in the premium calculation, an additional savings of \$12 to \$13 million from commissions and premium tax will be realized.

The amount of savings does vary by type of vehicle.

On the average, claim cost for trucks and cars would reduce by \$24 and \$13 per year per vehicle respectively. Claim cost for motorcycles or mopeds, however, will experience an increase of \$31 per year if the insurance company has the right of subrogation (or \$85 per year if the insurance company does not have the right of subrogation).

The amount of reduction in claim cost by type of vehicle is as follows:

<u>Type of Vehicle</u>	<u>Units in 1,000s*</u>	<u>Change in loss cost</u>	<u>Claim cost reduction in \$1,000s</u>
Passenger cars	4,094	\$(13)	53,222
Trucks	904	(24)	21,696
Motorcycles/mopeds	157	31 to 85	(4867) to (13345)
			<u>70,051 to 61,573</u>

The derivations of the change in loss cost by type of vehicle are shown in exhibits 1 to 3 (pp. 593-595).

* 1985 MTC annual report

PRIVATE PASSENGER CARS LOSS COST

	<u>Current</u>	<u>Proposed</u>	<u>Change</u>
Medical	7.72	18.56	10.84
Funeral	0.22	0.88	0.66
Death	1.20	3.47	2.27
Disability - wage earner	13.57	30.94	17.37
- student	nil	2.58	2.58
- house care	incl	0.16	0.16
- child care	nil	2.29	2.29
Quebec part III	<u>0.92</u>	<u>0.46</u>	<u>(0.46)</u>
Total no fault	23.63	59.34	35.71
Uninsured motorist	<u>8.55</u>	<u>6.81</u>	<u>(1.74)</u>
Total acc. benefit (a)	32.18	66.15	33.97
Bodily injury (claims only)	198.64	173.67	(24.97)
BI claim adj. expense	29.68	29.68	nil
Abolishing collateral source rule	na	(6.62)	(6.62)
Prejudgment interest rule	na	(9.14)	(9.14)
Party and party costs re: small claims court	<u>na</u>	<u>(5.76)</u>	<u>(5.76)</u>
Total bodily injury loss cost (b)	228.32	181.83	(46.49)
Property damage loss cost (c)	78.76	78.76	nil
Total compulsory sections, a + b + c	339.26	326.74	(12.52)

COMMERCIAL VEHICLES (Ordinary Trucks)

	<u>Current</u>	<u>Proposed</u>	<u>Change</u>
Medical	2.87	6.89	4.02
Funeral	0.14	0.56	0.42
Death	0.94	2.72	1.78
Disability - wage earner	6.55	14.93	8.38
- student	nil	1.24	1.24
- house care	incl	0.06	0.06
- child care	nil	0.92	0.92
Quebec part III	<u>0.64</u>	<u>0.32</u>	<u>(0.32)</u>
Total no fault	11.14	27.64	16.50
Uninsured motorist	<u>2.86</u>	<u>2.39</u>	<u>(0.47)</u>
Total acc. benefit (a)	14.00	30.03	16.03
Bodily injury (claims only)	213.41	195.15	(18.26)
BI claim adj. expense	31.89	31.89	nil
Abolishing collateral source rule	na	(5.65)	(5.65)
Prejudgment interest rule	na	(9.82)	(9.82)
Party and party costs re: small claims court	<u>na</u>	<u>(6.19)</u>	<u>(6.19)</u>
Total bodily injury loss cost (b)	245.30	205.38	(39.92)
Property damage loss cost (c)	113.30	113.30	nil
Total compulsory sections, a + b + c	372.60	348.71	(23.89)

MOTORCYCLES LOSS COST

	<u>w/o subrogation</u>			<u>w/ subrogation</u>	
	<u>Current</u>	<u>Proposed</u>	<u>Change</u>	<u>Proposed</u>	<u>Change</u>
Medical	17.06	40.94	23.88	-	-
Funeral	1.06	4.24	3.18	-	-
Death	2.49	7.20	4.71	-	-
Disability - wage earner	41.89	95.51	53.62	-	-
- student	nil	21.36	21.36	-	-
- house care	incl	0.04	0.04	-	-
- child care	nil	0.57	0.57	-	-
Quebec part III	<u>1.61</u>	<u>0.81</u>	<u>(0.80)</u>		
Total no fault	64.11	170.67	106.56	85.34	21.23
Uninsured motorist	<u>18.74</u>	<u>14.83</u>	<u>(3.91)</u>	<u>14.83</u>	<u>(3.91)</u>
Total acc. benefit (a)	82.85	185.50	102.65	100.17	17.32
Bodily injury					
(claims only)	74.40	64.73	(9.67)	93.74	19.34
BI claim adj. expense	11.12	11.12	nil	13.90	2.78
Abolishing collateral					
source rule	na	(2.59)	(2.59)	(2.59)	(2.59)
Prejudgment interest rule	na	(3.42)	(3.42)	(3.42)	(3.42)
Party and party costs re:					
small claims court	<u>na</u>	<u>(2.16)</u>	<u>(2.16)</u>	<u>(2.16)</u>	<u>(2.16)</u>
Total bodily injury					
loss cost (b)	85.52	67.68	(17.84)	99.47	13.95
Property damage					
loss cost (c)	17.21	17.21	nil	17.21	nil
Total compulsory sections,					
a + b + c	185.58	270.39	84.81	216.85	31.27

Methodology and Assumptions

Our methodology assumes that the 1987 loss cost (as determined by I.B.C.) is representative of the current cost if no change in the policy is made. Each proposed change (whether it is a no fault benefit or a tort reform issue) is measured against the current cost.

Wherever possible, each claimant in the claims survey is subject to a policy change and the aggregate result of all claimants in the sample is compared against the actual figure to arrive at a percentage increase or decrease. This percentage change is then applied to the 1987 loss cost to determine the change in loss cost.

When it is not practical to analyze each claimant individually, total industry data is used, e.g. death benefit, funeral expense, Quebec part III, etc. The details of each proposed change and its impact on insurance loss cost can be found in the following sections:

- I
 - 1. Medical/rehabilitation
 - 2. Death benefit
 - 3. Funeral expense
 - 4. Disability benefit
 - A. wage earners
 - B. students
 - C. house care
 - D. child care
 - 5. Quebec part III
 - 6. Uninsured motorist coverage
- II
 - 1. Abolishing the collateral source rule
 - 2. Prejudgment interest
 - 3. Party and party costs, and small claims court

- III 1. Reduction in liability claim cost as an
 offset to accident benefit enhancements.

Limitations

While we have tried to verify our assumptions, it is not always possible. In these cases, we have to rely on our best judgment.

Not all of our assumptions should be considered equally reliable. With respect to tort reform, we have assumed that non-pecuniary loss will not be affected by any or all of the tort reform measures. This may or may not be true. The abolition of the collateral source rule could create an incentive for the employer to exclude disability due to automobile accidents in its group health policy. We have assumed that this will not occur. On the other hand, we have assumed that all severely injured persons would consume the policy limit on medical/rehabilitation and future care expense. This is probably not true.

We have employed detailed claimant data that was not available in the past. We believe it is the best information available. However, there is always some sampling error when one uses a small percentage of the population. In order to provide a margin for error, we have estimated the increase in no fault benefits on the high side and the reduction due to tort reform on the low side.

Detailed Analysis by Section

I 1. Medical/rehabilitation

Current:

reasonable and essential expenses, excess of OHIP, up to \$25,000 per person within 4 years

Proposed:

- (a) rehabilitation to a maximum of \$500,000 within 10 years or 20 years less the age of victim at the time of accident, whichever is longer.
- (b) long term care up to \$500,000, no time limit.

Assumptions:

- (a) The bodily injury claims survey was used to determine distribution of time loss. The accident benefits claims survey was used to determine the frequency of injuries requiring such a benefit. The IBC size of loss distribution was used to determine the frequency of claims with large disability payments.
- (b) 0.2% of the claimants are so severely injured that major renovations of residence or vehicles are necessary; all \$500,000 will be used up, \$185,000 in year one and \$35,000 in each of the subsequent nine (9) years. The 0.2% was selected after a study of the IBC size of loss distribution in policy years 1983/1984 and the percentage of claimants with catastrophic injuries in our sample.
- (c) 6.5% of the claimants either recover or cannot satisfy the more stringent definition of disability after 2 years. They are assumed to have partial disability and require vocational training @ \$4,000 per person. Such cost is not in the current system because the rehabilitation industry is still in its infancy stage.
- (d) 0.2% of the claimants require long term care -- cost starts at \$3,000/mo. increased by 5.5% p.a. -- until the limit is eventually used up. The first monthly payment is made after 12 months.

(e) Medical claim frequency is assumed to be 0.00644 being the average of the 1984 and 1985 policy years.

(f) All present values are based on a discount rate of 8% p.a.

Costs:

(i) Private Passenger Rehabilitation Cost
 = vocational training + renovations
 = $(.065 \times .00644 \times \$4000) + (.002 \times .00644 \times$

$$9$$

$$[\$150000 + \sum_{n=0} \$35000 \div 1.08^n])$$

 = \$1.67 + \$5.20
 = \$6.87

(ii) Private Passenger Future Care Expense
 = frequency x average claim amount

$$124 \qquad 1+j = {}^{12}\sqrt{1.055}$$

 = $(.002 \times .00644) \times \sum_{n=0}^{124} \frac{3000}{1.08^n}$

$$1+i = {}^{12}\sqrt{1.08}$$

$$\times [(1+j)/(1+i)]^n$$

 = \$3.97

(iii) Medical and Rehabilitation Cost Increase
 = \$6.87 + \$3.97
 = \$10.84

(iv) Current Medical and Rehabilitation Cost
 = \$7.72

(v) Percentage Increase
 = $100\% \times \$10.84/\7.72
 = 140%

Assuming the same percentage increase, i.e., 140% of the current benefit, the total increase in medical/rehab will be \$4.02 ($\2.87×1.40) per commercial vehicle and \$23.88 ($\17.06×1.40) per motorcycle.

I 2. Death Benefits

Current:

- (a) The death of the head of household results in a payment of \$10,000 to the spouse of the head of household plus an additional sum of \$1,000 for each other survivor.
- (b) The death of the spouse of the head of household results in a payment of \$10,000 to the head of the household.
- (c) The death of a dependant results in a payment of \$2,000.

Proposed:

- (a) The death of the head of household results in a payment of \$25,000 to the spouse of the head of household plus an additional sum of \$10,000 for each other surviving dependant.
- (b) The death of the spouse of the head of household results in a payment of \$25,000 to the head of household.
- (c) The death of a dependant results in a payment of \$10,000.

Assumptions:

- (a) The results are based on 1983-1985 IBC data.
- (b) Under both the current system and the revised system, benefit is based on the status at the date of the accident of the deceased in a household, where a spouse and/or dependants survive.
- (c) The dollar band from \$3,000 to \$9,998 was purposely omitted from our calculations as these amounts seemed implausible under the current system.

Costs:

Based on the 1983-1985 distributions, the proposed benefit schedule will increase cost by 189%.

The proposed benefit will result in an increase of \$2.27 per private passenger automobile ($189\% \times \$1.20$).

The same percentage increase, i.e., 189%, was assumed for motorcycles and commercial vehicles resulting in a per vehicle increase of \$4.71 ($189\% \times \2.49) and \$1.78 ($189\% \times \0.94) respectively.

I 3. Funeral Expense

Current:

\$1,000 per claimant fatally injured in accident.

Proposed:

\$4,000 per claimant fatally injured in accident.

Assumption:

Current costs are based on the IBC submission to the Inquiry.

Costs:

The cost of the proposed benefit is 400% of the current benefit.

(i)	current cost for private passenger vehicle	= \$0.22
	proposed cost for private passenger vehicle	= \$0.88
	increase	= \$0.66
(ii)	current cost for commercial vehicle	= \$0.14
	proposed cost for commercial vehicle	= \$0.56
	increase	= \$0.42
(iii)	current cost for motorcycles	= \$1.06
	proposed cost for motorcycles	= \$4.24
	increase	= \$3.18

I 4. Disability Benefit

A. Wage Earner

Current:

80% of gross weekly wages less employer and government benefits. The maximum weekly benefit is \$140. There is no waiting period.

Proposed:

Subject to a 7 day waiting period, 80% of gross weekly wages less employer benefits or the statutory weekly maximum; whichever is smaller is indexed to CPI up to 2 times the statutory weekly benefit maximum at the time of accident, the initial statutory weekly maximum is \$450.

Assumptions:

- (a) Results and costs are based on the information contained in the accident benefits claims survey.
- (b) If a claimant in the claims survey appeared to receive a weekly payment higher than the current maximum, his time loss was recalculated using \$140 as the weekly benefit.
- (c) Time loss is subject to a seven (7) day deductible.
- (d) Only claimants with time loss, non-zero weekly wage and known employer benefits (need not be non-zero) were included in the analysis.
- (e) All government benefits (CPP and UIC) are first payors in the current benefits, but they are considered as last payors in the proposed benefits.
- (f) Disability benefits for claimants receiving employer benefits less than their gross wage loss are calculated in different manners depending on length of disability.

- (i) For the first two (2) weeks of disability after the waiting period, the claimant receives 80% of gross wage loss; subject to a statutory maximum* unless the claimant receives 100% of his gross wage from his employer in which case there is no benefit payable.
- (ii) For the remainder of disability, the claimant receives 80% of gross wage loss less employer benefits, i.e.,
$$\text{benefit} = (.80 \times \text{gross wage loss}) - \text{employer benefits, subject to a statutory maximum*}.$$

* The initial statutory maximum is \$450.

- (g) The change in Consumer Price Index in Ontario is 5.5% per annum. In practice, indexing usually occurs once a year, say 1 January. To simplify our calculation, we assume indexing occurs monthly.
- (h) Only private passenger data from the survey is used to determine the percentage increase of the proposed benefits over the current benefits. As there are no permanent disability claimants in the sample, we assume 0.2% of the claimants are permanently disabled. The 0.2% was selected after a study of the IBC size of loss distribution in policy years 1983/1984 and the percentage of claimants with catastrophic injuries in our sample.
- (i) From the claims survey, 0.9% of the claimants have disability beyond two years. Together with assumption (h), we assume 1.1% of the claimants have disability for over two years.
- (j) Twenty percent of the injured persons would not receive any disability payment because their employer benefits are at least 80% of their gross wages. In order to put them on an equal footing with claimants who do not have employer benefits, these claimants will receive the incremental benefit due to indexing after 2 years of disability. Here, we assume

- (i) their employer benefits are not indexed;
- (ii) the average weekly wage is 125% of \$450.
- (k) Mortality rate is based on 85% of the 1969-1975 Canadian Institute of Actuaries Mortality Table. Current studies indicate that mortality rate is about 80% to 85% of the 1969-1975 C.I.A. Mortality Table.
- (l) All present values are calculated using a discount rate of 8% p.a.
- (m) All permanently disabled claimants are assumed to be aged 30.

Costs:

Private Passenger:

- (i) Cost of claimants with non-permanent injuries

$$= \sum_{k=1}^c \sum_{t=1}^{\text{time}} [\min \{(2 \times m); (\text{ben}_k \times (1+i)^t)\}] \div (1+j)^t$$

$$= \$1,141,575$$

time = time loss in months
 c = number of claimants in sample
 i = index rate = 5.5% p.a. converted to monthly rate
 j = discount rate = 8% p.a. converted to monthly rate
 ben_k = weekly benefit of kth claimant in the sample
 m = maximum weekly benefit = \$450

- (ii) Cost of claimant aged 30 with permanent injuries

$$= \sum_{t=1}^{912} [\min \{(2 \times m); (4.33 \times \text{ben} \times (1+i)^t)\}] \times {}^{n30+t/12} \div (1+j)^t$$

$$= \$421,597$$

$$\text{ben} = \text{weekly benefit} = .80 \times \$450 = 360$$

$${}^n_{30+t/12} = \text{survival rate in the } (30+t/12)^{\text{th}} \text{ year}$$

$$\begin{aligned} & \text{Cost of claimants with permanent injuries} \\ & = (\text{number of claimants in sample}) \times \\ & \quad (\text{frequency}) \times (\text{average claim amount}) \\ & = (298) \times (.002) \times \$421,597 = \$251,272 \end{aligned}$$

(iii) Cost of benefit to wage earners with employer benefits less than 80% of their gross wage loss

$$\begin{aligned} & = (\text{cost of claimants with non-permanent injuries}) + (\text{cost of claimants with permanent injuries}) \\ & = \$1,141,575 + \$251,272 = \$1,392,847 \end{aligned}$$

(iv) Private Passenger (cont'd.):

Cost of benefit to wage earners with employer benefits of at least 80% of their gross wage loss

$$= (\text{number of claimants}) \times (\text{frequency}) \times \text{average claim amount}$$

$$= (298) \times (0.20) \times 0.002 \times$$

$$\sum_{t=1}^{\infty} \frac{4.33 \times \min. [\$900; \$450 \times (1+j)^{24+t}] \times {}^n_{(32+t/12)}}{(1+j)^{24+t}}$$

$$- \sum_{t=1}^{\infty} \frac{4.33 \times \$450 \times {}^n_{(32+t/12)}}{(1+j)^{24+t}}$$

$$\begin{aligned} & = (298 \times .0004) \times \$176,555 \\ & = \$21,045 \end{aligned}$$

(v) Current Private Passenger:

Cost of benefit to wage earners with employer benefits of less than 80% of their gross wage loss

$$\begin{aligned} & = (\text{cost of claimants with non-permanent injuries}) + (\text{cost of claimants with permanent injuries}) \\ & = \$563,946 + [(298) \times (.002) \times \$93,921] \end{aligned}$$

= \$619,923

- (vi) Total increase in benefits to wage earners with employer benefits less than 80% of their gross weekly wage loss
= \$1,392,847 - \$619,923 = \$772,924

Percentage increase = $\frac{\$772,924}{\$619,923} \times 100 = 125\%$

Total increase in benefits to wage earners with employer benefits at least 80% of their gross weekly wage
= \$21,045

Percentage increase = $\frac{\$21,045}{\$619,923} \times 100 = 3\%$

- (vii) The benefit to wage earners will result in an increase in loss cost of 128.0% or \$17.37 (1.28 x \$13.57) per private passenger vehicle. Assuming the same percentage increase for commercial vehicles and motorcycles, the increase in loss cost is \$8.38 (1.28 x \$6.55) and \$53.62 (1.28 x \$41.89) respectively.

B. Student

Current:

none

Proposed:

- (a) Until deemed eligible to enter the work force, a lump sum yearly payment of:
 - (i) \$1,000 per year lost at the elementary school level
 - (ii) \$2,000 per year lost at the secondary school level
 - (iii) \$4,000 per year lost at the post-secondary school level.
- (b) A student with a lengthy disability will be eligible to receive a weekly benefit if, at the time of the accident:
 - (i) he is attending elementary school and attaining age nineteen (19) while still disabled
 - (ii) he is attending secondary school and attaining age nineteen (19) while still disabled
 - (iii) he is attending a post-secondary institution and attaining age twenty-three (23) while still disabled

at which time he/she will receive a weekly benefit of 80% of the average industrial weekly wage in Ontario on the date of accident.

Assumptions:

There is a downward bias for students to be included in the accident benefits claims survey as only claimants eligible for accident benefits are included. Since there does not exist a current benefit in the form of a student benefit, some students would be omitted from the survey.

- (a) Due to the limited information obtained on students via the accident benefits claims

survey, the bodily injury claims survey is used in arriving at the distribution of students by scholastic level and vehicle type.

- (b) To be included in this analysis, the claimant must be a student and experience time loss as a result of the accident. It is assumed that the number of claimants will increase by 15% in the case of cars and trucks and 31% in the case of motorcycles if the benefit were available today.
- (c) As the claims survey did not include information on level of schooling, level of schooling was determined by age.

A claimant is deemed to be:

- (i) at the elementary school level if fourteen (14) years of age or under
 - (ii) at the secondary school level if fifteen (15) to eighteen (18) years of age
 - (iii) at the post-secondary school level if nineteen (19) years of age or over.
- (d) A claimant is deemed to lose a year of education if disabled for thirteen (13), six (6), and three (3), weeks of a school year at the elementary, secondary and post-secondary school levels respectively.
 - (e) The lump sum yearly benefits are based on the grade the claimant would be attending if not disabled.
 - (f) As there is limited information on students with lengthy disabilities, it is assumed that 1.1% of the students would remain disabled after two (2) years and 0.2% would remain disabled beyond three (3) years.
 - (g) In calculating average lump sum amounts, the data obtained in the accident benefits claims survey are used.

- (i) the average lump sum payment paid to students involved in private passenger and commercial vehicle accidents assumes that the student is equally likely to be in attendance at an elementary school, a secondary school, or at a post-secondary institution.
 - (ii) the average lump sum payment paid to students involved in motorcycle accidents assumed that the student is equally likely to be in attendance at a secondary school or at a post-secondary institution.
- (h) Additional cost of permanently disabled students is based solely on the data obtained in the bodily injury claims survey. This additional cost is the present value of 80% of the average industrial wage in Ontario; indexed at 5.5% p.a. compounded monthly, discounted at 8% p.a. compounded monthly, and mortality is assumed to be 85% of 1969-1975 CIA Mortality Table. Due to limited information on permanently disabled students, this present value is based on the median age at each scholastic level.
- (i) the additional cost for students involved in private passenger and commercial vehicle accidents is predicated on the assumption that students are equally likely to be in attendance at an elementary school, a secondary school or at a post-secondary institution.
 - (ii) the additional cost for students involved in motorcycle accidents is based on students being equally likely to be in attendance at a secondary school or a post-secondary institution.

Costs:

- (i) Current cost for sample claimants
 $= \$563,946 + (298) \times (.002) \times (\$93,921)$
 $= \$619,923$ (same as wage earner)
- (ii) Loss of schooling
(Number of students) \times average claim amount
 $= (298 \times .15) \times \$1,901 = \$84,975$

Increase over current cost = $\$100\% \times$
 $\$84,975/\$619,923 = 14\%$

The loss of schooling benefit, i.e., the lump sum payment, for private passenger and commercial vehicle accident claimants will result in an increase of 14.0%. The increase for motorcycle accident claimants will be more than double at 39.0% ($298 \times .31 \times \$2,627/\$619,923$).

(iii) Loss of capacity to earn income
(Number of permanently disabled students) x
average claim amount ($298 \times .15 \times .002$) x
 $\$365,000 = \$32,631$
Increase over current cost = $\$32,631/\$619,923$
= 5%

The loss of capacity to earn income, i.e., the benefit to students with long term disability, for private passenger and commercial vehicle accident claimants will result in an increase of 5.0%. The increase for motorcycle accident claimants will be more than double at 12% ($298 \times .31 \times .002 \times \$406,000/\$619,923$).

The benefit to students will result in an increase in loss cost of 19% or \$2.58 (.19 x \$13.57) per private passenger car, \$1.24 (.19 x \$6.55) per commercial truck. The increase in loss cost for motorcycles, however, will be 51% or \$21.36 per vehicle (.51 x \$41.89).

C. House Care

Current:

Reasonable expenses incurred up to a maximum of \$70 per week of disability, subject to a maximum benefit period of twelve (12) weeks.

Proposed:

Reasonable expenses incurred up to a maximum of \$50 per week of disability, not subject to a maximum benefit period.

Assumptions:

- (a) Results and costs are based on the information contained in the Accident Benefits Claims survey.
- (b) Only homemakers with time loss and non-zero principal unpaid housekeeper benefits are considered.

Costs:

House care benefit:

Private Passenger loss cost

= frequency x average claim amount

= {frequency of disability x (number of
homemakers/total number of claimants)} x
\$410

= .0052 x .076 x \$410

= \$.016

Commercial auto: 40% of PP loss cost = \$0.06

Motorcycles: 25% of PP loss cost = \$0.04

D. Child Care

Current:

None

Proposed:

- (a) For the first 4 weeks of disability, the weekly benefit is \$150 plus an additional \$50 per week per child/dependant, subject to a maximum of \$350 per week. If disability continues beyond 4 weeks,

only actual and reasonable child care expenses incurred will be reimbursed. The maximum reimbursable expense is \$150 plus \$50 per child up to \$350 per week.

Assumptions:

- (a) Only homemakers with time loss are included to determine the average claim amount.
- (b) Frequency is based on average 1984-1985 IBC data.
- (c) Proportion of claimants who are homemakers from the accident benefit claims survey.
- (d) Double frequency of child care to reflect increased utilization.
- (e) Since the claims survey data does not contain information as to the number of children/dependants, one (1) child/dependant per household is assumed.
- (f) Child/dependant care benefits after the first four (4) weeks of disability is computed on the basis of \$200 per week.

Costs:

Child care benefit:

Private Passenger loss cost

$$\begin{aligned} &= \{ \text{frequency} \times 2 \times (\text{number of homemakers} / \text{total} \\ &\quad \text{number of claimants}) \} \times \text{average claim} \\ &= (.0052 \times 2.0 \times 0.076) \times \$2900 \\ &= \$2.29 \end{aligned}$$

$$\begin{aligned} \text{Commercial auto loss cost} &= 40\% \text{ of PP loss cost} \\ &= \$2.29 \times .40 \\ &= \$0.92 \end{aligned}$$

$$\begin{aligned} \text{Motorcycle loss cost} &= 25\% \text{ of PP loss cost} \\ &= \$0.57 \end{aligned}$$

I 5. Quebec Part III

Current:

Pays for the difference between Ontario automobile benefits and Quebec Régie's benefits.

Proposed:

Pays for the difference between Ontario automobile benefits and Quebec Régie's benefits.

Assumption:

The difference between Quebec Régie's benefits and the Ontario automobile benefits will narrow by at least 50% due to the enhancement of Ontario no fault benefits (section B).

Cost:

Current loss costs for private passenger cars, trucks and motorcycles are \$0.92, \$0.64 and \$1.61 respectively. Savings should be 50% of the current loss costs. Therefore, savings per car, truck and motorcycle will be \$0.46, \$0.32 and \$0.80 respectively.

I 6. Uninsured Motorist Coverage

Current:

Coverage against accidents caused by
uninsured motorists.

Proposed:

Coverage against accidents caused by
uninsured motorists.

Assumptions:

Since the benefits are similar to that paid
by the third party liability section (A) of
the policy, the same percentage reduction in
loss cost would occur.

Cost:

Loss cost will reduce by \$1.74 per private
passenger automobile, \$0.47 per commercial
vehicle, and \$3.91 per motorcycle.

The above figures are derived as follows:

uninsured motorist loss cost x $\frac{\text{BI reduction}}{\text{BI loss cost}}$

For cars: \$ 8.55 x \$46.49/\$228.32=\$1.74
For trucks: \$ 2.86 x \$39.92/\$245.30=\$0.47
For motorcycles: \$18.74 x \$17.84/\$85.52=\$3.91

II 1. Collateral Source Rule

Current:

Collateral Source Rule: A claimant can claim economic loss against the tort feisor even though he/she has been fully/partially compensated by "collateral sources", i.e., employer benefits, government programs, accident/sickness insurance, or any combination thereof.

Proposed:

Abolish the Collateral Source Rule.
Compensation from "collateral sources" less the applicable 1988 income taxes is deducted from bodily injury liability payment.

Assumptions:

- (a) The bodily injury claims survey and the supplemental bodily injury claims survey are used.
- (b) Collateral benefits are reported accurately without any understatement.
- (c) Claimants must have time loss, gross wage loss, and full information on employer benefits to be included in this analysis.
- (d) If a claimant in the claims survey appears to receive a (section B) weekly disability payment higher than the current maximum, his/her time loss is recalculated using \$140 as the weekly benefit.
- (e) Government benefits and employer benefits net of 1988 income taxes, and first party accident/sickness benefits are deducted from third party liability payments.
- (f) Increase in Section B benefit is taken into account.
- (g) Percentage of claim amount attributable to employment income loss is 23.8%, 18.9% and 24.9% for cars, trucks and motorcycles respectively.

Costs:

Based on the detailed claimant data in the bodily injury claims survey and the supplemental bodily injury claims survey, 14% of the bodily injury claims amount will be eliminated if the collateral source rule is abolished. Assuming the same percentage of reduction is realized by each type of vehicle, private passenger cars should have \$6.62 savings per vehicle while commercial trucks and motorcycles should have savings of \$5.65 and \$2.59 per vehicle respectively.

The amount of claims reduction is derived as follows:

(current bodily injury claim amount) x
(employment income portion of claim) x .14

For cars: \$198.64 x .238 x .14 = \$6.62
For trucks: \$213.41 x .189 x .14 = \$5.65
For motorcycles: \$ 74.40 x .249 x .14 = \$2.59

Additional Comments:

The above calculations are based on short run (12-18 months) expectations. Some employers may decide to exclude disability due to automobile accident in their group accident/sickness contracts if they feel that the savings in health insurance premium is substantial. If many employers put the automobile accident exclusion clause in their contracts, our savings projection will be overstated. However, we do not feel that it is very practical for an employer to introduce such a clause until he/she has sufficient experience and monetary incentive to do so.

II 2. Prejudgment Interest

Current:

Based on prevailing interest rate, in practice however, this is not always followed.

Proposed:

- (a) Prejudgment interest on non-pecuniary loss is calculated at 3.5% p.a. compounded annually.
- (b) Prejudgment interest on special damages is calculated at a rate equal to the Bank of Canada rate plus 1% p.a. compounded annually.

Assumptions:

- (a) Based on the composite result of the bodily injury claims survey, prejudgment interest is 10.2% of the average claim amount for all types of vehicles.
- (b) Claimants must receive some prejudgment interest to be included in this analysis.
- (c) No significant difference between stated and estimated prejudgment interest rates. This is confirmed by a standard statistical test.
- (d) Special damages are incurred evenly from date of accident to date of settlement.
- (e) Non-pecuniary loss is incurred on the date of accident.
- (f) To simplify calculations, interest is compounded monthly at a rate equivalent to those specified in the proposal.
- (g) Time till settlement, i.e., (settlement date - accident date), is rounded to the nearest month.
- (h) The Bank of Canada rate is initially set at 8.25% p.a.

Costs:

Based on the bodily injury claims survey, prejudgment interest should decline 45.1% if the proposed rates of interest were used.

The proposed benefit will result in a savings of 45.1% or a reduction in loss cost of \$9.14 per private passenger automobile. Assuming the same savings of 45.1% for commercial vehicles and motorcycles, the reduction in loss cost is \$9.82 and \$3.42 respectively.

The above figures are derived as follows:

Bodily injury claim amount x prejudgment
interest portion x .451

For cars:	$\$198.64 \times .102 \times .451 = \9.14
For trucks:	$\$213.41 \times .102 \times .451 = \9.82
For motorcycles:	$\$ 74.40 \times .102 \times .451 = \3.42

II 3. Small Claims Court

Current:

No restriction as to which court the case is to be tried.

Proposed:

All cases under \$10,000 must be tried in Small Claims Court first. No party and party costs for claims under \$10,000.

Assumptions:

- (a) Claim size distribution is based on the bodily injury claims survey.
- (b) A claim that results in a court award or settlement of less than \$10,000 will receive no party and party costs.

Costs:

Based on the bodily injury claims survey, party and party costs among claims below \$10,000 were 2.9% of the total bodily injury claim amount.

The proposal will reduce loss cost of \$5.76 per private passenger automobile, \$6.19 per commercial vehicle and \$2.16 per motorcycle.

The above figures are derived as follows:

(Bodily injury claim amount) x 0.029

For cars:	$\$198.64 \times .029 = \5.76
For trucks:	$\$213.41 \times .029 = \6.19
For motorcycles:	$\$74.40 \times .029 = \2.16

III 1. Reduction in Liability Claim Cost as an Offset to Accident Benefit Enhancements

When the accident benefits are increased substantially, they would reduce the economic loss component and sometimes non-economic loss component of the bodily injury claim. This offset has always been recognized by the insurance industry.

The claims survey, however, allows us to quantify the extent of the offset more precisely than in the past. If a claimant is not totally at fault, then all the accident benefits received could be deducted from his third party liability entitlement.

Based on the claims survey, 70% of the injured persons in private passenger cars and trucks were not totally at fault. Therefore, we assumed 70% of the enhanced benefits will be offset by a dollar-for-dollar third party liability reduction.

For cars, the offset
= .70 x accident benefit enhancement
= .70 x \$35.67 = \$24.97

Trucks do not always collide with trucks. In fact, they usually collide with cars. Therefore, their offset would be more like the amount for cars. We assumed they collide with cars half of the time (note: actual indication was 74%) and collide with other vehicle types half of the time.

For trucks, the offset
= .70 x 1/2 [truck accident benefit enhancement
+ car enhancement]
= .70 x 1/2 [\$16.51 + \$35.67]
= \$18.26

Motorcycles belong to a unique category. From the claims survey, we concluded only half of the injured persons were not totally at fault. Furthermore, 33% of them were involved in single vehicle accidents and 16% were victims of motorcycle to motorcycle accidents.

The offset for motorcycles (if there is no-subrogation)

$$\begin{aligned} &= 1/2 \text{ economic loss component of B.I. (see} \\ &\quad \text{bodily injury liability claims survey)} \\ &= 1/2 \times (.26) \times \$74.40 \\ &= \$9.67 \end{aligned}$$

If subrogation right is given to the motorcycle insurer (as well as the other insurer involved in a motorcycle related accident), the liability loss cost could increase by as much as 100% of economic loss component of B.I.

$$\begin{aligned} &= \$74.40 \times 0.26 \\ &= \$19.34 \end{aligned}$$

Furthermore, subrogation should increase claim adjustment expense by as much as 25%.

$$\begin{aligned} &= .25 \times \$11.12 \\ &= \$2.78 \end{aligned}$$

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APPENDIX IV

Exhibit I

SUMMARY OF FINDINGS ON CHANGE IN LOSS COST

going from Current System to Proposed Modified No-Fault System

Ontario Private Passenger Automobile (ex. Farmers)

1 Mandatory Coverages (including OHIP Levy in lieu of Subrogation)

1987 Fiscal Policy Year (i.e.: Policies written 01/07/86 to 30/06/87 inclusive)

Mandatory Coverage/Kind of Loss [1]	1987 F.P.Y. Ultimate Loss Cost per Car [2]	% Present Value Factor [3]	Old 1987 P.V. of Loss Cost per Car [4]	% Ratio New/Old [5]	New 1987 P.V. of Loss Cost per Car [6]	New-Old P.V. Difference [7]
01) Funeral	0.24	93.43	0.22	250.0	0.55	0.33
02) Medical + Rehabilitation	9.52	81.12	7.72	425.0	32.81	25.09
03) Death Benefits	1.28	93.43	1.20	263.0	3.16	1.96
04) Disability Income	16.72	81.12	13.57	394.0	53.47	39.90
05) Sub-Total of Above	27.76	81.81	22.71	396.3	89.99	67.28
06) Quebec Excess (Part III)	1.14	81.12	0.92	30.0	0.28	-0.64
07) Uninsured Motorist	11.05	77.39	8.55	60.0	5.13	-3.42
08) Accident Benefits Total	39.95	80.55	32.18	296.5	95.40	63.22
09) Bodily Injury up to Cut-off	118.89	86.49	102.83			-102.83
10) Bodily Injury over Cut-off	176.13	71.25	125.49	75.0	94.12	-31.37
11) Bodily Injury Total	295.02	77.39	228.32	41.2	94.12	-134.20
12) Property Damage	84.30	93.43	78.76	100.0	78.76	
13) Third Party Liability Coverage	379.32	80.96	307.08	56.3	172.88	-134.20
14) Sub-Total of Above	419.27	80.92	339.26	79.1	268.28	-70.98
15) OHIP Levy	8.38	100.00	8.38	100.0	8.38	
16) Grand Total Mandatory	427.65	81.29	347.64	79.6	276.66	-70.98

Notes: 1) Column [2]: Rows (1)-(4),(6),(7),(11),(12),(15) from related pages of Exhibit III; Row (10) = 59.7% of Row (11) (See Exhibit II).
Other Row values by Addition/Subtraction.

2) Column [3]: Rows (1),(3),(12) as Property Damage; Rows (7),(11) as Bodily Injury; Row (8) as Accident Benefits (See Exhibit IV).
Column [3]: Rows (9),(15) from Exhibit II; other Row values to balance.

3) Column [4] = Column [2] x Column [3]. Present Value is at 01/01/87 at 8% Effective Interest Rate.

4) Column [5]: Rows (1)-(4),(6),(7),(9),(10),(12),(15) from Exhibit II; other Rows calculated to balance.

5) Column [6] = Column [4] x Column [5]. Column [7] = Column [6] - Column [4].

6) Costing assumes no change in the Tort System, except restriction of tort to excess Economic Loss and Serious and Permanent Injury.

Time: 7:17:35 p.m. Apr. 23, 1987

Tillinghast

(A) Funeral Coverage

Current: Expenses incurred up to \$1,000 per person.

Proposed: Expenses incurred up to \$2,500 per person.

Assumptions: All get now a flat \$1,000 and will get a flat \$2,500 under proposed.

Adjustment Factor: 2.50

Medical and Rehabilitation Coverage

Current: Reasonable and essential expenses, excess of government and other plans, up to \$25,000 per person within a 4-year time limit.

Proposed: As current, but no dollar or time limit except a \$200,000 maximum per person on those expenses related to long-term care of persons unable to sustain an independent lifestyle.

Assumptions:

1. All current costs will remain.
2. An additional \$200,000 cost will be added for each of the 2% of D.I. claimants contemplated to be permanently totally disabled (see D.I. analysis, Duration of Disability table and also Appendix E for 1983 F.P.Y. size of loss distribution for medical + funeral + rehabilitation at the 42 month level).
3. There will be, in addition, a 15% frequency increase.

Adjustment Factor: For 1987 F.P.Y. (see Trend Calculations in Exhibit III. Note: * below denotes exponentiation).

Medical and rehabilitation:

$$\begin{aligned} \text{Frequency: } & .551 \times 1.106^* 4 \times .30 + .601 \times 1.106^* 3 \\ & \times .35 + .687 \times 1.106^* 2 \times .35 \\ & = .826 \end{aligned}$$

$$\text{Severity} = \frac{100 \times 9.52}{.826} = 1,153$$

Disability Income:

$$\begin{aligned} \text{Frequency} &= .423 \times 1.072^* 4 \times .30 + .490 \times 1.072^* 3 \\ & .35 + .544 \times 1.072^* 2 \times .35 \\ & = .598 \end{aligned}$$

Proposed severity for Medical and Rehabilitation:

$$= 1,153 + .02 \times \frac{.598}{.826} \times 200,000 \times 1.073$$

$$= 1,153 + 3,107 = 4,260$$

$$\begin{aligned} \text{Adjustment Factor} &= \frac{4,260}{1,153} \times 1.15 \\ &= 4.25 \end{aligned}$$

(C) Death Benefits

Current: \$10,000, Head of House or Spouse (1st survivor) + \$1,000 (each additional dependant survivor). \$2,000 non-spouse dependant. Death ensuing up to 180 days or 104 weeks if continuously disabled.

Proposed: 200% of unit benefit, Head of House or Spouse (1st survivor) + 25% of unit benefit (each additional dependant survivor). Any other person, provable expenses up to \$2,500. Death ensuing up to 180 days or 104 weeks if continuously disabled.

Unit Benefit = Annual D.I. Benefit (before any offsets) subject to a minimum of \$5,000 and a maximum of \$31,307.

Assumptions:

1. All 'other persons' will receive the maximum \$2,500.
2. Not all members of the population have equal exposure to death in automobile accidents.

Adjustment Factor: See Death Benefit table following.

With normalization to proposed count eligible, we have:

Average proposed severity over all wage levels = 14,726.

Average current severity over all wage levels = 6,244

Ratio = 2.36

At annual gross of 25,092, the corresponding ratio =
 $\frac{17,263}{5,978} = 2.89$

Selected Factor = $\frac{2.36 + 2.89}{2} = 2.63$

ARIO DEATH BENEFITS

Source: Revenue Canada Taxation Statistics, 1984 Taxation Year, Table 2, All Personal Returns by Total Income, Ontario only.

Description: All Returns including those with \$0 Employment Income. Gross Income from Employment taken as Wages and Salaries Income adjusted for other Sources of Employment Income (Commissions from Employment, other Employment Income, and Net Business, Professional, Commission, Farming, and Fishing Income), adjusted to 1987 Income Levels (trended at 4.5% per annum).

Benefit: 90% of Annual Net Income, subject to a Minimum of \$5,000 and a Maximum of \$31,307. Annual Net Income approximated from adjusted Gross Income from Employment by Deduction of C.P.P. Tax, U.I.C. Tax, and Income Tax at 1987 Levels. Income Tax calculated assuming no Income other than Income from Employment, and assuming no Deductions other than Employment Expense Deduction, Basic Personal Exemption, and displayed number of Dependant Married and Child Exemptions.

Analysis: Discrete Approximation based on a 74 interval partition of Tax Return Total Income. Number of Other Spouses taken as 70% of Column [2], less Column [3]. 90% Net Income Capped at \$600 per Week.

Current Benefits: House Head or Spouse Death: \$10,000 (1st Survivor) + \$1,000 (each other dependant Survivor);
Dependant Non-Spouse Death: \$2,000

Proposed Benefits: House Head or Spouse Death: 200% of Unit Benefit (1st Survivor) + 25% of Unit Benefit (each other dependant Survivor);
Death of Person without Spouse or Dependents: \$2,500

10% Ann. Gross Wage	Number Earning	# Dependt Spouses	# Other Spouses	# Dependt Children	New Unit Benefit	Average Current Benefit per Claimant				Average Proposed Benefit per Claimant			
						Wage Earner	Dependant Spouse	Dependant Child	Total	Wage Earner	Dependant Spouse	Dependant Child	Total
0	1,023,363	132,969	583,385	316,581	5,000	7,309	10,442	2,000	6,451	8,137	10,552	2,500	7,143
657	76,285	12,561	40,839	19,143	5,000	7,251	10,358	2,000	6,682	8,064	10,448	2,500	7,355
1,308	53,581	5,723	31,784	20,157	5,000	7,376	10,537	2,000	6,240	8,220	10,672	2,500	6,946
1,796	54,731	3,844	34,468	9,733	5,000	7,178	10,254	2,000	6,613	7,972	10,318	2,500	7,325
2,241	62,204	3,075	40,468	7,826	5,000	7,126	10,180	2,000	6,706	7,907	10,225	2,500	7,426
2,700	62,954	3,729	40,339	7,615	5,000	7,121	10,173	2,000	6,749	7,901	10,216	2,500	7,464
3,176	68,193	4,041	43,694	5,742	5,000	7,084	10,120	2,000	6,867	7,855	10,150	2,500	7,580
3,575	68,062	4,416	43,227	7,833	5,000	7,115	10,164	2,000	6,784	7,894	10,206	2,500	7,495
4,006	67,481	3,993	43,244	5,921	5,000	7,088	10,125	2,000	6,855	7,860	10,157	2,500	7,568
4,454	67,930	3,284	44,267	5,103	5,000	7,075	10,107	2,000	6,866	7,844	10,134	2,500	7,585
4,844	71,584	3,552	46,557	5,566	5,000	7,078	10,111	2,000	6,861	7,847	10,139	2,500	7,579
5,364	76,257	4,195	49,185	6,728	5,000	7,088	10,126	2,000	6,842	7,860	10,158	2,500	7,557
5,751	77,690	3,822	50,561	8,352	5,000	7,108	10,154	2,000	6,762	7,884	10,192	2,500	7,482
6,141	79,503	5,296	50,356	9,409	5,297	7,118	10,169	2,000	6,779	8,323	10,211	2,500	7,847
6,501	71,376	4,448	45,515	9,826	5,668	7,138	10,197	2,000	6,707	8,880	10,246	2,500	8,219
7,159	75,351	5,328	47,418	11,633	6,083	7,154	10,221	2,000	6,682	9,501	10,276	2,500	8,663
7,610	69,508	6,589	42,067	11,849	6,341	7,171	10,244	2,000	6,704	9,898	10,304	2,500	8,931
8,130	71,450	5,991	44,124	11,515	6,673	7,161	10,230	2,000	6,696	10,361	10,288	2,500	9,337
8,598	70,197	6,008	43,130	13,261	6,987	7,189	10,270	2,000	6,627	10,862	10,337	2,500	9,587
8,996	65,901	5,593	40,538	12,325	7,234	7,187	10,267	2,000	6,630	11,216	10,334	2,500	9,875
9,501	68,694	7,472	40,614	14,919	7,588	7,217	10,310	2,000	6,616	11,785	10,388	2,500	10,150
10,065	65,344	7,137	38,604	12,278	7,944	7,188	10,268	2,000	6,696	12,245	10,336	2,500	10,672
10,859	64,648	6,366	38,888	13,995	8,448	7,217	10,309	2,000	6,589	13,034	10,387	2,500	11,102
11,301	62,062	8,210	35,233	15,792	8,760	7,254	10,364	2,000	6,587	13,571	10,454	2,500	11,242
11,634	63,003	8,084	36,018	15,608	8,969	7,248	10,354	2,000	6,593	13,862	10,442	2,500	11,498

Time: 4:17:43 p.m. Apr. 17, 1987

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ONTARIO DEATH BENEFITS

Data Source: Revenue Canada Taxation Statistics, 1984 Taxation Year, Table 2, All Personal Returns by Total Income, Ontario only.

Data Description: All Returns including those with \$0 Employment Income. Gross Income from Employment taken as Wages and Salaries Income adjusted for other Sources of Employment Income (Commissions from Employment, other Employment Income, and Net Business Professional, Commission, Farming, and Fishing Income), adjusted to 1987 Income Levels (trended at 4.5% per annum).

Unit Benefit: 90% of Annual Net Income, subject to a Minimum of \$5,000 and a Maximum of \$31,307. Annual Net Income approximated from adjusted Gross Income from Employment by Deduction of C.P.P. Tax, U.I.C. Tax, and Income Tax at 1987 Levels. Income Tax calculated assuming no Income other than Income from Employment, and assuming no Deductions other than Employment Expense Deduction, Basic Personal Exemption, and displayed number of Dependant Married and Child Exemptions.

Analysis: Discrete Approximation based on a 74 interval partition of Tax Return Total Income. Number of Other Spouses taken as 70% of Column [2], less Column [3]. 90% Net Income Capped at \$600 per Week.

Current Benefits: House Head or Spouse Death: \$10,000 (1st Survivor) + \$1,000 (each other dependant Survivor);
Dependant Non-Spouse Death: \$2,000

Proposed Benefits: House Head or Spouse Death: 200% of Unit Benefit (1st Survivor) + 25% of Unit Benefit (each other dependant Survivor)
Death of Person without Spouse or Dependents: \$2,500

100% Ann. Gross Wage	Number Earning	# Dependt Spouses	# Other Spouses	# Dependt Children	New Unit Benefit	Average Current Benefit per Claimant				Average Proposed Benefit per Claimant				Total
						Wage Earner	Spouse	Child	Total	Wage Earner	Spouse	Child	Total	Total
12,206	63,082	7,102	37,055	14,500	9,305	7,230	10,328	2,000	6,594	14,312	10,410	2,500	11,222	11,222
12,908	64,253	7,177	37,800	17,699	9,753	7,275	10,394	2,000	6,479	15,076	10,492	2,500	12,068	12,068
13,668	61,607	6,890	36,235	15,692	10,225	7,255	10,364	2,000	6,530	15,716	10,455	2,500	12,671	12,671
13,978	63,437	7,316	37,090	17,179	10,433	7,271	10,387	2,000	6,500	16,063	10,484	2,500	12,947	12,947
14,591	61,633	8,395	34,748	18,396	10,833	7,298	10,426	2,000	6,493	16,725	10,533	2,500	13,723	13,723
15,390	62,242	7,028	36,541	15,402	11,289	7,247	10,354	2,000	6,551	17,253	10,442	2,500	14,195	14,195
15,949	63,731	9,134	35,478	20,049	11,670	7,315	10,449	2,000	6,476	18,006	10,562	2,500	13,968	13,968
16,273	63,882	8,777	35,940	19,830	11,870	7,310	10,443	2,000	6,469	18,289	10,554	2,500	14,243	14,243
16,982	61,322	8,868	34,057	19,346	12,307	7,315	10,451	2,000	6,477	18,950	10,563	2,500	14,913	14,913
17,581	63,393	8,370	36,005	20,463	12,666	7,323	10,461	2,000	6,427	19,504	10,576	2,500	15,580	15,580
18,272	60,918	8,040	34,603	22,022	13,095	7,362	10,516	2,000	6,343	20,267	10,646	2,500	16,413	16,413
18,714	62,678	9,589	34,286	24,087	13,388	7,384	10,549	2,000	6,353	20,780	10,686	2,500	16,966	16,966
19,376	60,666	9,907	32,559	24,318	13,809	7,401	10,573	2,000	6,348	21,466	10,716	2,500	17,682	17,682
19,759	63,476	8,734	35,699	21,248	14,013	7,335	10,478	2,000	6,416	21,541	10,598	2,500	18,639	18,639
20,524	58,022	9,163	31,452	22,777	14,506	7,392	10,561	2,000	6,350	22,482	10,701	2,500	19,683	19,683
21,105	57,810	7,984	32,483	26,070	14,844	7,451	10,544	2,000	6,182	23,205	10,805	2,500	19,510	19,510
21,443	58,473	9,817	31,114	26,444	15,078	7,452	10,646	2,000	6,261	23,564	10,808	2,500	20,272	20,272
21,972	52,747	8,745	28,178	24,827	15,399	7,471	10,672	2,000	6,222	24,121	10,840	2,500	20,461	20,461
22,713	52,258	9,282	27,299	26,858	15,860	7,514	10,734	2,000	6,177	24,992	10,918	2,500	20,410	20,410
22,971	49,882	8,413	26,504	26,880	16,012	7,539	10,770	2,000	6,110	25,324	10,962	2,500	20,786	20,786
23,837	52,818	9,472	27,501	27,356	16,538	7,518	10,740	2,000	6,175	26,045	10,925	2,500	21,470	21,470
24,105	51,912	9,049	27,289	31,097	16,702	7,599	10,856	2,000	6,028	26,634	11,070	2,500	21,104	21,104
24,642	49,356	10,165	24,384	28,757	17,062	7,583	10,832	2,000	6,138	27,122	11,040	2,500	21,662	21,662
25,092	50,686	8,973	26,507	32,251	17,312	7,636	10,909	2,000	5,978	27,741	11,136	2,500	22,377	22,377
25,841	48,490	9,587	24,356	27,997	17,774	7,577	10,825	2,000	6,125	28,199	11,031	2,500	22,730	22,730

Time: 4:17:46 p.m. Apr. 17, 1987

RATIO DEATH BENEFITS

Source: Revenue Canada Taxation Statistics, 1984 Taxation Year, Table 2, All Personal Returns by Total Income, Ontario only.

Description: All Returns including those with \$0 Employment Income. Gross Income from Employment taken as Wages and Salaries Income adjusted for other Sources of Employment Income (Commissions from Employment, other Employment Income, and Net Business, Professional, Commission, Farming, and Fishing Income), adjusted to 1987 Income Levels (trended at 4.5% per annum).

Unit Benefit: 90% of Annual Net Income, subject to a Minimum of \$5,000 and a Maximum of \$31,307. Annual Net Income approximated from adjusted Gross Income from Employment by Deduction of C.P.P. Tax, U.I.C. Tax, and Income Tax at 1987 Levels. Income Tax calculated assuming no Income other than Income from Employment, and assuming no Deductions other than Employment Expense Deduction, Basic Personal Exemption, and displayed number of Dependant Married and Child Exemptions.

Analysis: Discrete Approximation based on a 74 interval partition of Tax Return Total Income. Number of Other Spouses taken as 70% of Column [2], less Column [3]. 90% Net Income Capped at \$600 per Week.

Current Benefits: House Head or Spouse Death: \$10,000 (1st Survivor) + \$1,000 (each other dependant Survivor);
Dependant Non-Spouse Death: \$2,000

Proposed Benefits: House Head or Spouse Death: 200% of Unit Benefit (1st Survivor) + 25% of Unit Benefit (each other dependant Survivor);
Death of Person without Spouse or Dependents: \$2,500

10% Ann. Wage	Number Earning	% Dependt Spouses	% Other Spouses	% Dependt Children	New Unit Benefit	Average Current Benefit per Claimant				Average Proposed Benefit per Claimant			
						Wage Earner	Dependant Spouse	Dependant Child	Total	Wage Earner	Dependant Spouse	Dependant Child	Total
26,982	95,735	17,059	49,956	58,229	18,407	7,608	10,969	2,000	6,024	29,319	11,086	2,500	18,369
28,271	89,288	18,791	43,711	60,331	19,210	7,676	10,965	2,000	6,010	30,889	11,207	2,500	18,523
29,197	87,027	18,888	42,031	57,033	19,762	7,655	10,936	2,000	6,056	31,655	11,170	2,500	19,076
30,050	85,308	20,133	39,583	64,061	20,301	7,751	11,073	2,000	5,972	32,983	11,341	2,500	18,892
31,617	83,333	20,131	38,202	66,343	21,229	7,796	11,137	2,000	5,928	34,696	11,422	2,500	19,358
32,949	81,727	19,757	37,452	72,114	21,992	7,882	11,261	2,000	5,823	36,390	11,576	2,500	19,498
33,452	75,860	18,566	34,536	65,685	22,270	7,866	11,237	2,000	5,850	36,749	11,546	2,500	19,776
34,557	70,718	18,247	31,256	66,446	22,928	7,940	11,342	2,000	5,800	38,235	11,678	2,500	19,838
35,797	61,472	15,648	27,382	55,656	23,603	7,905	11,293	2,000	5,829	39,136	11,617	2,500	20,536
36,641	60,645	15,396	27,056	52,372	24,065	7,864	11,234	2,000	5,876	39,637	11,542	2,500	21,123
38,868	136,443	39,956	55,554	136,160	25,373	7,998	11,426	2,000	5,823	42,602	11,782	2,500	21,193
41,236	107,481	31,320	43,917	110,004	26,675	8,024	11,462	2,000	5,793	44,920	11,828	2,500	21,999
44,663	164,203	46,783	68,159	178,258	28,552	8,086	11,551	2,000	5,715	48,472	11,939	2,500	23,028
49,218	100,227	31,261	38,898	117,891	30,863	8,176	11,680	2,000	5,696	53,034	12,100	2,500	24,013
54,243	95,318	28,656	38,067	107,882	31,307	8,132	11,617	2,000	5,709	53,438	12,021	2,500	24,618
61,109	40,199	10,886	17,253	42,154	31,307	8,049	11,498	2,000	5,717	52,787	11,873	2,500	25,275
67,745	23,257	5,881	10,399	25,307	31,307	8,088	11,554	2,000	5,633	53,097	11,943	2,500	25,133
72,820	14,237	3,782	6,184	15,826	31,307	8,112	11,588	2,000	5,642	53,281	11,985	2,500	24,921
75,942	9,666	2,112	4,668	9,424	31,307	7,973	11,390	2,000	5,661	52,194	11,737	2,500	26,100
90,548	14,475	3,410	6,723	16,217	31,307	8,121	11,600	2,000	5,558	53,351	12,001	2,500	25,034
110,624	8,084	1,950	3,709	10,382	31,307	8,285	11,835	2,000	5,428	54,633	12,293	2,500	24,078
134,759	7,480	1,264	3,972	8,604	31,307	8,150	11,643	2,000	5,354	53,583	12,054	2,500	25,222
165,749	3,151	411	1,795	3,274	31,307	8,040	11,484	2,000	5,354	52,718	11,855	2,500	26,210
368,722	5,310	658	3,059	4,741	31,307	7,893	11,275	2,000	5,492	51,568	11,594	2,500	27,389

Total over all Wages:

17,944 5,636,790 872,549 3,073,208 2,554,649 1,131,035 7,453 10,857 2,000 6,244 20,833 11,071 2,500 14,726

Time: 4:17:51 p.m. Apr. 17, 1987

(D) Disability Income Coverage

Current:

- Wage earner: minimum of \$140 and (80% of gross weekly, less offsets).
- Principal unpaid non-employed housekeeper: flat \$70 per week, maximum 12 weeks.
- Others: no benefits.
- Offsets: All government plans and employer STD and LTD plans in total. Pro rata share of any individual disability plans (except no offsets for first 14 days, except for employer plans).
- Definition of Disability: substantial inability to perform essential duties of own occupation, up to 104 weeks. Unable to engage in any reasonably suited occupation after 104 weeks.

Proposed:

- Wage earner: 90% of 'Net Income From Employment', maximum \$600 per week, less offsets, payable to age 65.
- All persons: Indemnity for reasonably provable expenses for ordinary essential services performed, maximum \$200 per week per household for up to 3 years.
- Children up to high school: 90% of 'Net Income' corresponding to gross income at 75% of average industrial wage, payable from age 18 to age 65.
- Post secondary students: 90% of 'Net Income' corresponding to gross income at 100% of average industrial wage (or higher if demonstrable) payable from expected date of graduation to 65.
- Net income: gross less U.I.C. tax, C.P.P. tax, Income tax.
- Offsets: as current + actual or imputed (after 104 weeks) continuing employment income for persons unable to engage in own occupation, but able to return to a lower paying job). All taxable offsets to be reduced to a net income equivalent.
- Definition of Disability: Unable to perform own job.
- Indexing: at 60% of annual C.P.I. change, not to exceed 6%.

D) Disability Income Coverage

Assumptions:

1. The change in definition of disability will not increase the proportion of long-term claimants materially. (Quebec uses the proposed definition up to 5 years - see duration of disability table).
2. Full 'replacement services' costs of \$200 per week for up to 3 years will be claimed by 50% of all persons who are not dependant children.
3. An investment interest rate of 8% per annum is appropriate, reduced to 5% for indexed benefits.
4. The average age of a disabled wage earner is 35. (Ontario accident facts indicates the average age of all B.I. victims to be about 32). The average age of a child under 18 is 8. The average age of a student over 18 is 20.
5. The average wage for all wage earners (see Ontario wage table) is a reasonable surrogate for the average industrial wage.
6. The average offset for both current and proposed is 10%.

Compare: Current versus proposed average weekly benefits for wage earners (see wage table following).

<u>Offset %</u>	<u>0</u>	<u>10</u>	<u>20</u>	<u>30</u>	<u>40</u>
Current	122.07	119.08	115.38	110.47	103.60
Proposed	272.80	242.48	212.17	181.87	151.55
Ratio	2.23	2.04	1.84	1.65	1.46

(e.g. at 10%: current = .70 x 100% of gross capped average at $\frac{140}{.70}$ = .70 x 170.11 = 119.08

proposed = $\frac{.80}{.90}$ x 90% net

capped average at 600 = $\frac{8}{9}$ x 272.20 = 242.48)

7. There will be, in addition, a further 15% frequency increase.

(D) Disability Income Coverage

Proposed vs. Current

<u>Category</u>	<u>Current No. of Persons (000)</u>	<u>Current Adjusted Weekly Benefit</u>	<u>Adjusted Proposed No. of Persons (000)</u>	<u>Proposed Adjusted Weekly Benefit</u>
Wages	4,613	119.08	4,613	242.48
Replacement Services	873	17.15	3,255	99.65
Children under 18			1,458	92.18
Students over 18			<u>250</u>	<u>208.52</u>
Total	<u>5,486</u>	<u>102.86</u>	<u>9,576</u>	<u>170.16</u>

Notes:

1. Number of persons - see Death Benefit Table (Children under 18 from Statistics Canada) = 2430, reduced by 40% to reflect relative reduced exposure; students over 18 at 2550 - 2430 = 125, doubled to reflect increased relative exposure).

$$\begin{aligned}
 2. \text{ Adjusted Current Replacement Services} &= \frac{8\% \text{ T.P.V. } (.25)}{8\% \text{ T.P.V. } (30)} \times 70 \\
 &= \frac{5.84 \times 70}{23.83} = 17.15
 \end{aligned}$$

(see Duration table following)
(T.P.V. = Truncated Present Value)

$$\begin{aligned}
 3. \text{ Adjusted Proposed Replacement Services} &= \frac{5\% \text{ T.P.V. } (3)}{5\% \text{ T.P.V. } (30)} \times 200 \\
 &= \frac{14.09 \times 200}{28.28} = 99.65
 \end{aligned}$$

$$\begin{aligned}
 4. \text{ Adjusted proposed children under 18} &= .75 \times 90\% \text{ net for gross of } 420.19 \times \\
 &\quad \frac{5\% \text{ T.P.V. } (57) - 5\% \text{ T.P.V. } (10)}{5\% \text{ T.P.V. } (30)} \\
 &= .75 \times 294.57 \times \frac{31.90 - 20.10}{28.28} \\
 &= 92.18
 \end{aligned}$$

(see Wage Table following)

D) Disability Income Coverage

Notes:

$$\begin{aligned}
 \text{Adjusted Students over 18} &= (1.00 \times 90\% \text{ net for gross of } 420.19 \\
 &\quad + \text{Portion with gross over } 420.19 \\
 &\quad \times (90\% \text{ Net Capped (Infinity)} \\
 &\quad - 90\% \text{ net capped (420.19)))} \\
 &\quad \times \frac{5\% \text{ T.P.V. (45)} - 5\% \text{ T.P.V. (2)}}{5\% \text{ T.P.V. (30)}} \\
 &= (294.57 + .4077 \times (282.80 - 211.04)) \times \\
 &\quad \frac{30.85 - 12.64}{28.28} \\
 &= 208.52
 \end{aligned}$$

Adjustment Factor

$$\text{Indexing Adjustment} = \frac{5\% \text{ T.P.V. (30)}}{8\% \text{ T.P.V. (30)}} = \frac{28.28}{23.83} = 1.187$$

$$\text{Final Adjustment} = 1.15 \times \frac{170.16}{102.86} \times \frac{9576}{5486} \times 1.187 = 3.94$$

ONTARIO DURATION OF DISABILITY

Incomplete Expected Present Value of a Continuous Annuity at a Rate of \$1 per week with Payout truncated at Listed Duration. Duration of Disability Based on Quebec Experience for Accident Year 1978 adjusted to add 50% more Claimants with Duration less than one week in recognition of the seven day deductible in force in Quebec, and extended assuming no recovery after a duration of Seven Years.

Duration of Disability in Years	% who exceed Duration	Present Value (Truncated at Duration) at Effective Annual % Interest Rate of					
		0.00	3.00	4.00	5.00	8.00	10.00
0.000	100.0	0.00	0.00	0.00	0.00	0.00	0.00
0.019	66.7	0.83	0.83	0.83	0.83	0.83	0.83
0.083	48.7	2.75	2.75	2.75	2.75	2.75	2.74
0.250	23.3	5.89	5.87	5.87	5.86	5.84	5.83
0.500	12.7	8.24	8.20	8.18	8.17	8.13	8.10
1.000	6.0	10.68	10.58	10.55	10.52	10.44	10.38
1.500	4.0	11.98	11.84	11.80	11.75	11.62	11.54
2.000	3.4	12.95	12.76	12.70	12.64	12.47	12.36
3.000	2.9	14.59	14.29	14.19	14.09	13.82	13.65
4.000	2.6	16.03	15.58	15.44	15.30	14.92	14.68
5.000	2.4	17.33	16.72	16.53	16.35	15.84	15.53
6.000	2.1	18.50	17.72	17.48	17.25	16.61	16.23
7.000	2.0	19.57	18.60	18.31	18.03	17.26	16.81
10.000	2.0	22.70	21.04	20.55	20.10	18.89	18.20
12.500	2.0	25.31	22.91	22.23	21.61	19.99	19.10
15.000	2.0	27.92	24.65	23.75	22.94	20.90	19.80
17.500	2.0	30.53	26.26	25.13	24.12	21.65	20.36
20.000	2.0	33.14	27.76	26.39	25.17	22.27	20.80
25.000	2.0	38.36	30.45	28.55	26.91	23.20	21.41
30.000	2.0	43.58	32.76	30.33	28.28	23.83	21.80
35.000	2.0	48.79	34.76	31.79	29.35	24.26	22.04
40.000	2.0	54.01	36.49	32.99	30.19	24.55	22.18
45.000	2.0	59.23	37.97	33.97	30.85	24.75	22.27
50.000	2.0	64.45	39.26	34.79	31.37	24.89	22.33
55.000	2.0	69.67	40.36	35.45	31.77	24.98	22.37
60.000	2.0	74.88	41.32	36.00	32.09	25.04	22.39
65.000	2.0	80.10	42.14	36.45	32.33	25.08	22.40

TIME: 4:05:38 p.m. Apr. 17, 1987

1987 ONTARIO WAGE DISTRIBUTION

Data Source: Revenue Canada Taxation Statistics, 1984 Taxation Year, Table 2, All Personal Returns by Total Income, Ontario only.

Data Description: All Returns with Employment Income greater than \$0. Gross Income from Employment taken as Wages and Salaries Income adjusted for other Sources of Employment Income (Commissions from Employment, other Employment Income, and Net Business, Professional, Commission, Farming, and Fishing Income), adjusted to 1987 Income Levels (trended at 4.5% per annum).

Net Income: Approximated from adjusted Gross Income from Employment by Deduction of C.P.P. Tax, U.I.C. Tax, and Income Tax at 1987 Levels. Income Tax calculated assuming no Income other than Income from Employment, and assuming no Deductions other than Employment Expense Deduction, Basic Personal Exemption, and displayed average number of Dependant Married and Child Exemptions.

Analysis: Discrete Approximation based on a 73 interval partition of Tax Return Total Income.

100 % Gross Income from Employment (See the comments above for source)						On 100% of Gross Basis		On 80% of Gross Basis		On 90% of Net Basis	
Weekly (\$)	Number at	Avg % Full	Avg % Full	Percent at	% above	Weekly (\$)	Avg Capped	Weekly (\$)	Avg Capped	Weekly (\$)	Avg Capped
Wage Level	Wage Level	Exmp-Spouse	Exmp-Child	Wage Level	Wage Level	Wage Level	at Level	Wage Level	at Level	Wage Level	at Level
0.00	0	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
12.59	76,285	0.16	0.25	1.65	98.35	12.59	12.59	10.07	10.07	11.07	11.07
25.06	53,581	0.11	0.38	1.16	97.19	25.06	24.85	20.05	19.88	22.02	21.84
34.41	54,731	0.07	0.18	1.19	96.00	34.41	33.94	27.53	27.15	30.24	29.83
42.94	62,204	0.05	0.13	1.35	94.65	42.94	42.13	34.35	33.70	37.73	37.02
51.75	62,954	0.06	0.12	1.36	93.29	51.75	50.47	41.40	40.37	45.42	44.30
60.87	68,193	0.06	0.08	1.48	91.81	60.87	58.98	48.70	47.18	53.28	51.63
68.51	68,062	0.06	0.12	1.48	90.33	68.51	65.99	54.81	52.79	59.88	57.69
76.77	67,481	0.06	0.09	1.46	88.87	76.77	73.45	61.42	58.76	67.01	64.13
85.35	67,930	0.05	0.08	1.47	87.40	85.35	81.08	68.28	64.86	74.40	70.70
92.83	71,584	0.05	0.08	1.55	85.85	92.83	87.61	74.26	70.09	80.86	76.34
102.80	76,257	0.06	0.09	1.65	84.19	102.80	96.17	82.24	76.94	89.38	83.66
110.22	77,690	0.05	0.11	1.68	82.51	110.22	102.42	88.18	81.94	95.39	88.72
117.68	79,503	0.07	0.12	1.72	80.79	117.68	108.57	94.14	86.86	101.50	93.76
126.51	71,376	0.06	0.14	1.55	79.24	126.51	115.71	101.21	92.57	108.63	99.52
137.20	75,351	0.07	0.15	1.63	77.60	137.20	124.18	109.76	99.34	116.58	105.82
145.85	69,508	0.09	0.17	1.51	76.10	145.85	130.89	116.68	104.71	121.54	109.67
155.81	71,450	0.08	0.16	1.55	74.55	155.81	138.47	124.65	110.78	127.88	114.49
164.79	70,197	0.09	0.19	1.52	73.03	164.79	145.17	131.83	116.13	133.91	118.99
172.41	65,901	0.08	0.19	1.43	71.60	172.41	150.73	137.93	120.59	138.64	122.44
182.10	68,694	0.11	0.22	1.49	70.11	182.10	157.67	145.68	126.13	145.43	127.30
192.89	65,344	0.11	0.19	1.42	68.69	192.89	165.23	154.31	132.19	152.25	132.08
208.12	64,648	0.10	0.22	1.40	67.29	208.12	175.69	166.50	140.56	161.92	138.73
216.59	62,062	0.13	0.25	1.35	65.95	216.59	181.39	173.27	145.11	167.87	142.73
222.97	63,903	0.13	0.25	1.37	64.58	222.97	185.60	178.38	148.48	171.89	145.38

Time: 4:09:26 p.m. Apr. 17, 1987

1987 ONTARIO WAGE DISTRIBUTION

Data Source: Revenue Canada Taxation Statistics, 1984 Taxation Year, Table 2, All Personal Returns by Total Income, Ontario only.

Data Description: All Returns with Employment Income greater than \$0. Gross Income from Employment taken as Wages and Salaries Income adjusted for other Sources of Employment Income (Commissions from Employment, other Employment Income, and Met Business, Professional, Commission, Farming, and Fishing Income), adjusted to 1987 Income Levels (trended at 4.5% per annum).

Met Income: Approximated from adjusted Gross Income from Employment by Deduction of C.P.P. Tax, U.I.C. Tax, and Income Tax at 1987 Levels. Income Tax calculated assuming no Income other than Income from Employment, and assuming no Deductions other than Employment Expense Deduction, Basic Personal Exemption, and displayed average number of Dependant Married and Child Exemptions.

Analysis: Discrete Approximation based on a 73 interval partition of Tax Return Total Income.

100 % Gross Weekly (\$)	Number at Wage Level	Avg # full Exp-Spouse	Avg # full Exp-Child	Percent at Wage Level	% above Wage Level	On 100% of Gross Basis Weekly (\$)	Avg Capped at Level	On 80% of Gross Basis Weekly (\$)	Avg Capped at Level	On 90% of Met Basis Weekly (\$)	Avg Capped at Level
233.93	63,082	0.11	0.23	1.37	63.21	233.93	192.68	187.14	154.14	178.33	149.54
247.39	64,253	0.11	0.28	1.39	61.82	247.39	201.19	197.91	160.95	186.91	154.96
261.94	61,607	0.11	0.25	1.34	60.49	261.94	210.18	209.55	168.15	195.95	160.55
267.88	63,437	0.12	0.27	1.38	59.11	267.88	213.78	214.30	171.02	199.94	162.97
279.63	61,633	0.14	0.30	1.34	57.78	279.63	220.72	223.70	176.58	207.65	167.52
294.94	62,242	0.11	0.25	1.35	56.43	294.94	229.57	235.95	183.65	216.34	172.54
305.66	63,731	0.14	0.31	1.38	55.04	305.66	235.62	244.53	188.49	223.66	176.67
311.88	63,882	0.14	0.31	1.38	53.66	311.88	239.04	249.50	191.23	227.50	178.79
325.46	61,322	0.14	0.32	1.33	52.33	325.46	246.33	260.37	197.06	235.86	183.27
336.93	63,393	0.13	0.32	1.37	50.96	336.93	252.33	269.54	201.86	242.73	186.87
350.17	60,918	0.13	0.36	1.32	49.64	350.17	259.08	280.14	207.26	250.95	191.06
356.66	62,678	0.15	0.38	1.36	48.28	356.66	263.29	286.93	210.63	256.59	193.86
371.35	60,666	0.16	0.40	1.31	46.96	371.35	269.42	297.08	215.53	264.65	197.75
378.68	63,476	0.14	0.33	1.38	45.59	378.68	272.86	302.94	218.29	268.56	199.58
393.33	58,022	0.16	0.39	1.26	44.33	393.33	279.54	314.66	223.63	278.00	203.89
404.48	57,810	0.14	0.45	1.25	43.08	404.48	284.48	323.58	227.58	284.48	206.76
410.96	58,473	0.17	0.45	1.27	41.81	410.96	287.27	328.77	229.82	288.97	208.70
421.09	52,747	0.17	0.47	1.14	40.67	421.09	291.51	336.87	233.20	295.12	211.27
435.29	52,258	0.18	0.51	1.13	39.53	435.29	297.28	348.23	237.82	303.95	214.86
440.25	49,882	0.17	0.54	1.08	38.45	440.25	299.24	352.20	239.39	306.88	216.02
456.84	52,818	0.18	0.52	1.14	37.31	456.84	305.62	365.47	244.50	316.96	219.89
461.97	51,912	0.17	0.60	1.13	36.18	461.97	307.54	369.58	246.03	320.10	221.06
472.26	49,356	0.21	0.58	1.07	35.11	472.26	311.26	377.81	249.01	326.99	223.56
480.89	50,686	0.18	0.64	1.10	34.01	480.89	314.29	384.71	251.43	331.78	225.24
495.23	48,490	0.20	0.58	1.05	32.96	495.23	319.17	396.18	255.33	340.63	228.25

Time: 4:09:29 p.m. Apr. 17, 1987

ONTARIO WAGE DISTRIBUTION

Source: Revenue Canada Taxation Statistics, 1984 Taxation Year, Table 2, All Personal Returns by Total Income, Ontario only.

Description: All Returns with Employment Income greater than \$0. Gross Income from Employment taken as Wages and Salaries Income adjusted for other Sources of Employment Income (Commissions from Employment, other Employment Income, and Net Business, Professional, Commission, Farming, and Fishing Income), adjusted to 1987 Income Levels (trended at 4.5% per annum).

Income: Approximated from adjusted Gross Income from Employment by Deduction of C.P.P. Tax, U.I.C. Tax, and Income Tax at 1987 Levels. Income Tax calculated assuming no Income other than Income from Employment, and assuming no Deductions other than Employment Expense Deduction, Basic Personal Exemption, and displayed average number of Dependant Married and Child Exemptions.

Analysis: Discrete Approximation based on a 73 interval partition of Tax Return Total Income.

Weekly (\$)	Number at	Avg \$ Full	Avg \$ Full	Percent at	% above	Weekly (\$)	Avg Capped	Weekly (\$)	Avg Capped	Weekly (\$)	Avg Capped
Wage Level	Wage Level	Exmp-Spouse	Exmp-Child	Wage Level	Wage Level	Wage Level	at Level	Wage Level	at Level	Wage Level	at Level
517.11	95,735	0.18	0.61	2.08	30.89	517.11	326.38	413.69	261.10	352.77	232.25
541.82	89,288	0.21	0.68	1.94	28.95	541.82	334.01	433.46	267.21	368.16	237.00
559.57	87,027	0.22	0.66	1.89	27.06	559.57	339.15	447.66	271.32	378.72	240.06
575.92	85,308	0.24	0.75	1.85	25.22	575.92	343.57	460.74	274.86	389.07	242.86
605.93	83,333	0.24	0.80	1.81	23.41	605.93	351.14	484.74	280.91	406.85	247.34
631.47	81,727	0.24	0.88	1.77	21.64	631.47	357.12	505.18	285.70	421.47	250.77
641.10	75,860	0.24	0.87	1.64	19.99	641.10	359.20	512.88	287.36	426.82	251.92
662.28	70,718	0.26	0.94	1.53	18.46	662.28	363.44	529.82	290.75	439.42	254.44
686.05	61,472	0.25	0.91	1.33	17.13	686.05	367.83	548.84	294.26	452.34	256.83
702.21	60,645	0.25	0.86	1.31	15.81	702.21	370.59	561.77	296.48	461.19	258.34
744.91	136,443	0.29	1.00	2.96	12.86	744.91	377.35	595.93	301.88	486.27	262.31
790.28	107,481	0.29	1.02	2.33	10.53	790.28	383.18	632.22	306.54	511.22	265.52
855.97	164,203	0.28	1.09	3.56	6.97	855.97	390.09	684.78	312.08	547.20	269.31
943.26	100,227	0.31	1.18	2.17	4.79	943.26	396.18	754.61	316.94	591.48	272.39
1,039.57	95,318	0.30	1.13	2.07	2.73	1,039.57	400.79	831.66	320.64	636.80	274.56
1,171.16	40,199	0.27	1.05	0.87	1.86	1,171.16	404.38	936.93	323.51	697.79	276.23
1,298.33	23,257	0.25	1.09	0.50	1.35	1,298.33	406.75	1,038.66	325.40	757.57	277.34
1,395.60	14,237	0.27	1.11	0.31	1.04	1,395.60	408.06	1,116.48	326.45	803.20	277.96
1,455.42	9,686	0.22	0.97	0.21	0.83	1,455.42	408.69	1,164.34	326.95	824.63	278.18
1,735.34	14,475	0.24	1.12	0.31	0.52	1,735.34	411.02	1,388.27	328.82	938.45	279.13
2,120.11	8,084	0.24	1.28	0.18	0.35	2,120.11	413.03	1,696.09	330.42	1,093.70	279.94
2,582.66	7,480	0.17	1.15	0.16	0.18	2,582.66	414.63	2,066.13	331.70	1,276.02	280.57
3,176.57	3,151	0.13	1.04	0.07	0.12	3,176.57	415.71	2,541.26	332.57	1,512.26	281.00
7,066.53	5,310	0.12	0.89	0.12	0.00	7,066.53	420.19	5,653.22	336.15	3,071.84	282.80

Line: 4:09:32 p.m. Apr. 17, 1987

(E) Quebec Excess (Part III)

Current: Ontario resident injured in Quebec receives any excess of REGIE benefits over Ontario Accident Benefits.

Proposed: No change (but proposed Ontario Accident Benefits are richer).

Assumptions: Proposed Ontario Benefits are roughly comparable to Quebec REGIE except for the REGIE's 'meat chart' and death benefits, which items represent about 1/3 of REGIE's payout.

Adjustment
Factor: 0.30

) Uninsured Motorist Coverage

Current: B.I. (including death) from uninsured or unidentified and P.D. (layer from \$100 to \$25,100) from identified uninsured, up to minimum limits in the accident jurisdiction.

Proposed: No change.

Assumptions: There will be a 40% offset to current costs to reflect savings related to economic loss for B.I. from the proposed increases in Funeral, Medical + Rehabilitation, Death, and Disability Income benefits.

(G) Bodily Injury

Proposed:

Same as current except that tort will be restricted to cases where:

- a. There is an excess economic loss after consideration of benefits payable under the proposed auto policy and all collateral sources.
- b. There is death or permanent and serious injury.

A tort action based on "a." only may address economic loss only.

Assumptions:

1. The other features of the proposed plan, together with collateral benefits, will indemnify all economic loss except for the high income layer of those individuals with very high income from employment, some of whom will have potential tort action based on death or serious and permanent injury.
2. The 1987 Ontario Wage Table (see Disability Income Analysis) indicates that about 4.4% of wage earners will bump into the \$600 cap on 90% net weekly wage, and that their disability income under the proposal will be deficient by about

$$\frac{\$282.80 - \$272.50}{.044}$$

= \$227.27 per week.

Wage earners make up about

$$\frac{5,637 - 1,023}{5,637 + 873 + 2,555} \times 100\%$$

= 51% of the population. (See Death Benefit Analysis Table)

3. The American Study 'Compensating Automobile Accident Victims' (U.S. Department of Transport, May, 1985) indicates on page 19 that about 6.0% of bodily injury claims are for serious, severe, critical and fatal cases. Mr. J. Cheng (Canadian Underwriter, February 1987, page 38) indicates that 7% of B.I. claims and 55% of B.I. Loss dollars are associated with permanent and serious injury.

Bodily Injury

4. We will assume that the top 8% of B.I. claims will remain in tort and that the tort system will remain unchanged relative to these claims. This corresponds to 56.2% of the B.I. Loss dollars remaining in Tort, based on the 1983 F.P.Y. size-of-loss distributon for B.I. at the 54 month development level (see Table following).
5. Claims close in increasing order of ultimate severity.

Adjustments:

56.2% of B.I. L + ALAE remains.

43.8% of B.I. L + ALAE is eliminated, all of it closed prior to 54 months for a F.P.Y. (or 48 months for an accident year) (see Exhibit IV).

LDF 48 to ultimate on an accident year = 1.088 (See Appendix A).

% of ultimate B.I. Loss + ALAE remaining =

$$100 - \frac{43.8}{100 \times 1.088} = 59.7$$

Present value factor for 41.6% eliminated.

$$= \frac{4.59 + 15.02 + 18.53 \times .82}{4.84 + 16.90 + 22.56 \times .82} = .8649$$

(see Exhibit IV)

Preliminary indications from the I.B.C. Ontario B.I. Claims Survey indicate that the upper layer of B.I. remaining in tort might be appropriately reduced by about 25% to reflect savings related to economic loss from the proposed increases in accident benefits coverage.

INSURANCE BUREAU OF CANADA

Ontario Private Passenger Automobile (ex. Farmers)

Third Party Liability Bodily Injury (and Passenger Hazard)

Adjusted Raw Incurred Size of Loss Distribution

for

1983 Fiscal Policy Year at 54 Months (December 31, 1986)

Pure Loss Range Floor	Number of Claims	Amount of Pure Loss	Amount of ALAE	Amount of Loss+ALAE	Number over Floor	Per Cent	Loss+ALAE over Floor Dollars	Per Cent
1	4,556	5,030,345	2,642,043	7,672,388	32,085	100.0	507,010,440	100.0
1,001	4,476	6,502,843	1,335,442	7,838,285	27,529	85.8	499,338,052	98.5
2,001	3,002	7,310,595	1,035,481	8,346,076	23,053	71.8	491,499,767	96.9
3,001	2,379	8,069,216	938,189	9,007,405	20,051	62.5	483,153,691	95.3
4,001	2,110	9,289,105	1,010,661	10,299,766	17,672	55.1	474,146,286	93.5
5,001	3,520	20,936,933	2,058,569	22,995,502	15,562	48.5	463,846,520	91.5
7,501	2,517	21,280,315	1,831,016	23,111,331	12,042	37.5	440,851,018	87.0
10,001	2,891	34,275,724	2,640,360	36,916,084	9,525	29.7	417,739,687	82.4
15,001	1,637	27,572,934	2,002,434	29,575,368	6,634	20.7	360,823,603	75.1
20,001	1,106	24,022,978	1,680,455	25,703,433	4,997	15.6	351,248,235	69.3
25,001	1,324	38,602,736	2,118,077	40,720,813	3,891	12.1	325,544,802	64.2
36,631	99	2,886,458	158,376	3,044,834	2,567	8.0	284,823,989	56.2
37,501	745	31,105,012	1,799,676	32,904,688	2,468	7.7	281,779,155	55.6
50,001	985	66,784,524	3,144,370	69,928,894	1,723	5.4	248,874,467	49.1
100,001	424	57,111,838	2,388,036	59,499,874	738	2.3	178,945,573	35.3
200,001	145	33,466,340	1,140,483	34,606,823	314	1.0	119,445,699	23.6
300,001	112	40,708,501	1,443,354	42,151,855	169	0.5	84,838,876	16.7
500,001	49	29,322,859	498,175	29,821,034	57	0.2	42,687,021	8.4
1,000,001	8	12,783,605	82,382	12,865,987	8	0.0	12,865,987	2.5

Note: 1) Row with Column [7] = 8.0 and the Row immediately above obtained by Linear Interpolation from original Row above

Property Damage Coverage

Proposed: No change from current.

Assumptions: 1.00

(H) OHIP

Current: 2.4% of Third Party Liability Premium.

Assumptions:

1. OHIP agreement will be revised to generate the same revenue from the reduced proposed third party premium and/or accident benefits premium.
2. This amount is payable at the average premium date of the fiscal policy year.

Adjustment Factor: 1.00

Note:

See Calculation for estimated 1987 F.P.Y. Loss Cost Following.

OHIP AGREEMENT LOSS COST

INSURANCE BUREAU OF CANADA

Ontario Private Passenger Automobile (ex. Farmers)

Estimated Third Party Average Premium and OHIP Levy

for

1987 Fiscal Policy Year

Fiscal Policy Year [1]	Average Third Party Premium [2]	OHIP Levy [3]
1982	194.89	
1983	212.61	
1984	214.18	
1985	217.80	
1986	277.48	
Calendar Yr 1986-2	332.65	
1987 (Estimated)	349.29	8.38

- Notes: 1) Column [2] Data derived from 1986 Green Book, page 15 except 1986-2 Calendar Year Datum from Average Premium Run supporting 1986 Green Book Pure Premium Exhibit.
- 2) Estimated 1987 FPY Average Premium taken as 1986-2 Calendar Year value plus 5%.
- 3) OHIP Third Party Premium Tax Rate taken as 2.4%.
- 4) It is assumed herein that the OHIP Formula will be adjusted in the Proposed Environment to produce the same revenue.

Time: 12:51:55 p.m. Apr. 20, 1987

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INSURANCE BUREAU OF CANADA

Ontario Private Passenger Automobile (ex. Farmers)

Coverage and Kind of Loss: Accident Benefits - Funeral

Ultimate Loss and Loss Adjustment Expense

Trend Analysis and Projection of 1987 Fiscal Policy Year Ultimate Loss Cost Per Car-Year Exposed

Fiscal Policy Year	Earned Car-Years of Exposure	Incurred Number of Claims	Ultimate Incurred Loss and LAE	Ultimate Incurred Frequency	Ultimate Incurred Severity	Ultimate Loss Cost per Car-Year	Trended 1987 F.P.Y.	
							F.P.Y. Weight	Level Ultimate Loss Cost per Car-Year
[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
1981	3,461,394	1,668	2,210,851	0.048	1,325	0.64		0.64
1982	3,496,517	1,009	1,338,615	0.029	1,327	0.38		0.38
1983	3,564,108	684	906,608	0.019	1,325	0.25	30	0.25
1984	3,723,956	649	853,062	0.017	1,314	0.23	35	0.23
1985	3,874,593	737	968,731	0.019	1,314	0.25	35	0.25
Latest 5 Year Log-Linear Fit Annual Trend				0.788	0.997	0.786		
Latest 4 Year Log-Linear Fit Annual Trend				0.871	0.996	0.868		
Latest 3 Year Log-Linear Fit Annual Trend				1.000	0.996	0.996		
Latest 2 Year Log-Linear Fit Annual Trend				1.118	1.000	1.118		
Selected Annual Trend Factor				1.000	1.000	1.000		
Projected Ultimate Loss Cost for 1987 F.P.Y.							100	0.24

- Notes: 1) Column [2] from 1985 Green Book, page 15
 2) Column [3] from Appendix C
 3) Column [4] from Appendix D
 4) Column [5] = $100 \times \text{Column [3]} / \text{Column [2]}$
 5) Column [6] = $\text{Column [4]} / \text{Column [3]}$
 6) Column [7] = $\text{Column [4]} / \text{Column [2]}$
 7) Column [9] = $\text{Column [7]} \times \text{L. C. Trend} \times \text{Year Difference}$
 8) Projected Ultimate L. C. = $.01 \times \text{sum of Column [8]} \times \text{Column [9]}$
 9) Column [3] taken as 125% of Death Benefit Column [3] adjusted for Exposure
 10) Column [4] taken as $\text{Column [3]} \times \$1225 \text{ (AIX System)} \times \text{ULAE Factor}$

Time: 3:46:33 p.m. Apr. 17, 1987

APPENDIX V

REGULATORY AND CRIMINAL SANCTIONS FOR UNSAFE DRIVING

Licensing Requirements

Licensing regulation in Ontario is covered by Part III of the Highway Traffic Act (H.T.A.).¹ Having a licence to drive in Ontario is considered a privilege rather than a right.²

It is unlawful to drive without a licence³ or for an owner to allow someone to drive his or her car without a licence.⁴ The penalty for driving without a licence is a fine of between \$100 and \$500.⁵ Drivers are required to carry their licences with them and to surrender them for inspection to the police.⁶ The requirement to carry an Ontario licence does not apply to non-residents or new residents of Ontario who meet particular requirements.⁷

It is illegal to drive with a licence which has been cancelled, revoked, suspended, is fictitious, or has been

¹H.T.A., R.S.O. 1980, c.198, ss.17-40, as amended.

²H.T.A., s.17(a).

³H.T.A., s.18(1).

⁴H.T.A., s.18(4).

⁵H.T.A., s.18(10).

⁶H.T.A., s.19(1).

⁷H.T.A., s.20.

fraudulently obtained.⁸ A driver cannot lend⁹ or borrow¹⁰ a licence and must surrender a revoked or suspended licence.¹¹

It is unlawful to have more than one licence¹² unless the second licence is a learner's permit for a different class, such as that for driving motorcycles.¹³

The driving age in Ontario is 16. No one under the age of 16 can drive on any highway,¹⁴ even on a motor-assisted bicycle (moped),¹⁵ although anyone under 16 is permitted to drive farm machinery off the highway or directly across it.¹⁶ No one may hire a person under 16 to drive on the highway.¹⁷

It is unlawful to rent a car to someone unless that

⁸H.T.A., s.21(1)(a).

⁹H.T.A., s.21(1)(6).

¹⁰H.T.A., s.21(1)(c).

¹¹H.T.A., s.21(1)(d).

¹²H.T.A., s.21(1)(e).

¹³H.T.A., s.21(2).

¹⁴H.T.A., s.23(1).

¹⁵H.T.A., s.24.

¹⁶H.T.A., s. 23(3).

¹⁷H.T.A., s.23(2).

person has a licence.¹⁸ In order to rent a car, a person must produce a valid Ontario driver's licence.¹⁹

A driver's licence can be suspended for the following reasons: conviction for criminal negligence causing death, criminal negligence causing bodily harm, manslaughter with a vehicle, dangerous operation of a motor vehicle, failure to stop at the scene of an accident, operation of a motor vehicle while impaired or with more than 80 milligrams of alcohol in the blood, impaired driving causing bodily harm or death, or failure to provide a blood sample when demanded. On conviction of any of these offences, a driver's licence will be suspended for a minimum of one year on the first conviction, two years on a second and three years on any subsequent conviction.²⁰ On conviction of any of the above offences, except criminal negligence causing death and manslaughter (with a vehicle, which carry a maximum penalty of life imprisonment, the trial judge may extend a licence suspension by up to three years.²¹ On conviction of those offences carrying a maximum penalty of life imprisonment, a trial judge may extend a licence suspension for any period considered desirable for the protection of the public.²²

¹⁸ H.T.A., s.25(1).

¹⁹ H.T.A., s.25(3).

²⁰ H.T.A., s. 26(1).

²¹ H.T.A., s.26(3)(a).

²² H.T.A., s.26(3)(b).

Anyone convicted of the criminal offence of driving while disqualified is subject to a provincially imposed licence suspension of one year on the first conviction and two years on any subsequent conviction.²³ If the driver has been prohibited from driving in Canada under the Criminal Code,²⁴ the period of suspension will be either the period of provincial suspension or the period of criminal prohibition, whichever is longer.²⁵ Anyone who has not paid a fine under the Highway Traffic Act²⁶, the Public Vehicles Act,²⁷ the Public Commercial Vehicles Act²⁸ or any of the regulations, may have their licence suspended or denied until that fine is paid. Driving while one's licence has been suspended for a contravention of the statutes referred to above is punishable by a fine of not more than \$500.²⁹

If a blood test reveals 50 milligrams or more of alcohol in a driver's bloodstream or a driver refuses to provide a breath sample, the driver's licence may be suspended for 12 hours.³⁰ If there is no one to remove

²³H.T.A., s.27(1).

²⁴R.S.C. 1970, c.C-34, as amended.

²⁵H.T.A., s.27(a).

²⁶R.S.O. 1980, c.198.

²⁷R.S.O. 1980, c.425.

²⁸R.S.O. 1980, c. 407.

²⁹H.T.A., s.30(1).

³⁰H.T.A., s.30(a)(4).

the vehicle from the scene, the police will tow it, store it, and the driver will be charged for the expense.³¹

Any loss or denial of licence may be appealed to the Licence Suspension Appeal Board.³² The Board's decision may be appealed to a judge of the District Court.³³

Driving with a suspended licence is punishable, on a first offence by a fine of not less than \$250 and not more than \$2,000, on a subsequent offence by a fine of \$500 to \$2,000 and/or in either case, to imprisonment for up to six months.³⁴ Conviction for driving while suspended may increase the period of suspension by six months.³⁵

The Lieutenant Governor in Council has the right to set the classes of vehicles for licence purposes, the type of licence and the content of the driver's examination.³⁶ There are ten types of licences applicable to various classes of vehicles and drivers. The requirements for obtaining these licences are set out in the regulations to the Highway Traffic Act.³⁷

³¹H.T.A., ss.30 (11),(12).

³²H.T.A., s. 31.

³³H.T.A., s.32(3).

³⁴H.T.A., ss. 35(1).

³⁵H.T.A., ss. 35(3).

³⁶H.T.A., ss.18(7).

³⁷H.T.A., Reg. 462.

To obtain a licence, the applicant is required to take a driver's examination; if a driver has a general licence from another province or the United States, he or she must surrender the licence and pay the fee for an Ontario licence.³⁸ The Governor General, the Lieutenant Governor, diplomats or a member of the diplomatic staff with a valid foreign driver's licence, may obtain an Ontario driver's licence without an examination.³⁹

Demerit Points

(a) Regular drivers

Upon conviction of an offence under the Highway Traffic Act⁴⁰ a driver collects demerit points up to a total of 15, according to a schedule. When a driver has accumulated six to eight demerit points, the driver is notified by mail. When between nine and 14 demerit points are accumulated, the driver may be required to attend an interview to show cause why his or her licence should not be suspended. If the driver fails to appear, or to show proper cause why the licence should not be suspended, the Minister may suspend the licence for up to two years.

If a driver accumulates 15 or more demerit points, the Registrar will give notice and suspend the licence for 30 days after the date the licence is surrendered, or two

³⁸ H.T.A., Regulation 461.

³⁹ H.T.A., Regulation 461(3).

⁴⁰ R.S.O. 1980, c.198.

years from the date of suspension, whichever comes first. For any subsequent offence, the Registrar will give notice and suspend the licence for six months from the date the licence is surrendered or two years from the date of suspension, whichever comes first. After the suspension period is over, the driver's record is set at seven demerit points.

(b) Probationary Drivers

Drivers are classed as probationary for their first two years. If the driver has less than nine demerit points from the driver's learner's permit, or from a previous licence, the driver starts without demerit points. On the first occasion that demerit points are recorded, the probationary driver will receive a notice in the mail. Once six points have been accumulated, the licence is automatically suspended. The suspension time for probationary drivers is the same as that for regular drivers. Once the suspension period is over, the demerit points are reduced to zero.⁴¹

⁴¹O. Reg. 359/81.

DEMERIT POINT SCHEDULE

O. Reg. 359/81

Description	Number of Demerit Points
1. Failing to remain at the scene of accident	7
2. Careless driving	6
3. Racing	6
4. (a) Exceeding speed limit by 50 km/h or more	6
(b) Exceeding speed limit by 30 to 49 km/h	4
(c) Exceeding speed limit by 26 to 20 km/h	3
5. Driver of bus fails to stop at railway crossings	5
6. Driving through, around or under railway crossing barrier	3
7. Failing to yield right of way	3
8. Failing to obey a stop sign signal light or railway crossing signal	3
9. Failing to obey directions of police constable	3
10. Driving or operating a vehicle on a closed highway	3
11. Failing to report an accident	3
12. Improper passing	3
13. Improper driving where highway divided into lanes	3
14. Failing to stop for school bus	6
15. Following too closely	4
16. Crowding driver's seat	3

DEMERIT POINT SCHEDULE

Description		Number of Demerit Points
17.	Wrong way on a one-way street or highway	3
18.	Failing to stop properly at a pedestrian crossing	2
19.	Failing to share road	2
20.	Improper right turn	2
21.	Improper left turn	2
22.	Failing to signal	2
23.	Unnecessary slow driving	2
24.	Failure to lower high-beam headlights	2
25.	Improper opening of vehicle door	2
26.	Prohibited turn	2
27.	Towing persons on toboggans, bicycles	2
28.	Failure to obey portable signal lights	2

Criminal Code

Driving conduct is also regulated by the Criminal Code.⁴² I will not review each relevant section of the Code in detail. In addition, to the drinking and driving offences previously referred to, the Criminal Code regulates the following driving conduct:

- (a) criminal negligence causing death;⁴³
- (b) criminal negligence causing bodily harm;⁴⁴
- (c) dangerous driving causing bodily harm;⁴⁵
- (d) dangerous driving causing death;⁴⁶
- (e) leaving the scene of an accident with intent to escape civil or criminal liability.⁴⁷

If a driver is convicted of criminal negligence causing bodily harm or death, dangerous driving, dangerous driving causing bodily injury or death, leaving the scene of an accident, or impaired driving causing bodily harm or death, the court may make an order under the Criminal Code prohibiting the person from driving.⁴⁸ On conviction of an offence punishable by life imprisonment, the person may be prohibited from driving for any period; on conviction

⁴²R.S.C. 1970, c. C-34.

⁴³C.C., s. 203.

⁴⁴C.C., s. 204.

⁴⁵C.C., ss. 233(3).

⁴⁶C.C., ss. 233(4).

⁴⁷C.C., s. 236.

⁴⁸C.C., s. 242.

of offences punishable by a sentence of more than five years, the prohibition may be for up to ten years; and on conviction of any other offence, the prohibition may be for up to three years.⁴⁹

Driving Practices

Part IX of the Highway Traffic Act,⁵⁰ entitled "Rules of the Road", sets out the main provisions concerning driving conduct.

Three specific sections should be mentioned:

(a) School Bus Law

Section 151 of the H.T.A. deals with driver behaviour in relation to school buses. A driver is required to stop when a school bus is stopped with red signal lights flashing and may not proceed until the lights have stopped flashing. The only exception to this rule occurs where there is a median strip, and the car and bus are moving in opposite directions.⁵¹ The penalty for contravening this provision is a fine of \$100 to \$500 on a conviction of a first offence and a fine of \$250 to \$1,000, or imprisonment for up to six months on conviction of a second offence.⁵² As of 1982, the demerit points for failing to stop for a school bus increased from four to

⁴⁹C.C., ss. 242(2).

⁵⁰R.S.O. 1980, c. 198.

⁵¹H.T.A., ss. 151(5), (6).

⁵²H.T.A., s.19.

six points,⁵³ putting the offence on a par with careless driving, racing and exceeding the speed limit by more than 50 kilometers an hour. The only offence for which the penalty is more than six demerit points is failing to stop at the scene of an accident (seven points).

(b) Seat Belt Law

In 1976 it became mandatory to wear seat belts in Ontario.⁵⁴ The law applies to both drivers and passengers, including those sitting in the back seat. It is the driver's legal responsibility to ensure that children between the ages of two and 16 wear seat belts. In 1982, this provision was amended, making it mandatory that all children be secured in a manner prescribed by legislation, thus extending the seat belt law to include infant restraints.⁵⁵ The penalty for contravention of the seat belt legislation is a fine of between \$40 and \$200.⁵⁶

⁵³O. Reg. 599/82.

⁵⁴The Highway Traffic Amendment Act, 1975 (2nd session) (No. 2) S.O. 1975 (2nd session), c.14, s.1.

⁵⁵Highway Traffic Amendment Act 1982 S.O. 1982, c. 28, s.3.

⁵⁶See S.O. 1983, c. 63, s. 45, amending R.S.O. 1980 c. 198, s. 188.

(c) Motorcycle Helmet Law

In 1967 an amendment to the Highway Traffic Act⁵⁷ made the wearing of motorcycle helmets mandatory. The performance standards for helmets were prescribed by regulation in 1968.⁵⁸ The regulation states that a helmet must have a smooth outer shell lined with a padded material and must have a chin strap. It must conform to the standards of one of the following: the Canadian Standards Association, the Snell Memorial Foundation, the British Standards Institute or the United States of America Federal Motor Vehicle Safety Standard 218.⁵⁹ Failure to comply with the motorcycle helmet provision is also punishable by a fine of between \$40 and \$200.⁶⁰

(d) Speed Limits

Part VIII of the Highway Traffic Act sets out the provisions for speed limits in Ontario. The speed limit for any highway within a city, town, village, police village or built-up area is 50 kilometers per hour.⁶¹ Outside these areas, the speed limit for any highway or "controlled-access highway" is 80 kilometers per hour.⁶² Municipal councils or police village trustees can change

⁵⁷R.S.O. 1980 c. 198, s. 88.

⁵⁸See R.R.O. 1980, Regulation 482.

⁵⁹O. Reg. 482.

⁶⁰See footnote 56.

⁶¹H.T.A., ss. 109(2).

⁶²H.T.A., ss. 109(1).

these limits but they must be kept between 20 and 100 kilometers an hour.⁶³ The Ministry may designate construction zones on the highway and set speed limits for those areas.

Penalties for speeding are as follows:

20 km/h or more over the limit:	\$1.25 per km/hr.
20-39 km/h over the limit:	\$1.75 per km/hr.
40-59 km/h over the limit:	\$2.50 per km/hr.

If a driver were travelling 142 kilometers per hour in an 80 kilometer per hour zone, the fine would be \$201.50. If a driver were travelling at a speed exceeding the limit by 50 kilometers per hour, his or her licence could be suspended for up to 30 days.⁶⁴ (The demerit point schedule is set out in Item 4 of Table I.)

Vehicle Design

Legislative jurisdiction for vehicle design is shared by the federal and provincial governments. The federal Ministry of Transport administers the Motor Vehicle Safety Act⁶⁵ and the Ontario Ministry of Transportation & Communication administers Part V of the Highway Traffic Act.⁶⁶

The federal government has constitutional jurisdiction over international and inter-provincial trade. The long

⁶³ H.T.A., ss. 109(3).

⁶⁴ H.T.A., ss. 109(4).

⁶⁵ R.S.C. 1970, (1st Supp.), c.26.

⁶⁶ R.S.O. 1980, c. 198.

title of the Motor Vehicle Safety Act includes the wording "...and to provide safety standards for certain motor vehicles imported into or exported from Canada or sent or conveyed from one province to another." Federal standards apply at the level of the manufacturer, importer and dealer. Federal standards do not apply to the sale of a vehicle between private parties within a province, nor to the condition of motor vehicles being driven on the highways.

The provincial legislation sets standards for vehicles sold, registered or operated in the province. When vehicles are imported from outside Ontario, federal and provincial jurisdictions overlap. For the most part, federal standards apply to new cars and are enforced at the manufacturing or importing stage. Provincial standards apply to car owners.

Table I sets out the federal safety standards. They set requirements and standards for equipment installed in the vehicle.

Table 2 sets out the provincial standards. The general requirement for owners and drivers is set out as follows:

No person shall drive or operate or permit the driving or operation upon a highway of a vehicle or vehicles that in combination are in such a dangerous or unsafe condition as to endanger any person.⁶⁷

⁶⁷H.T.A., s.67 (as amended by S.O. 1983, c.63, s.17).

TABLE I: CANADIAN FEDERAL VEHICLE SAFETY STANDARDS

	Title	Effective date
101	Control location and identification	13/01/71
102	Transmission shift control sequence	"
103	Windshield defrosting and defogging	"
104	Windshield wiping and washing system	"
105	Brake system	"
106	Hydraulic brake hoses	"
107	Reflecting surfaces	"
108	Lighting equipment	"
108A	Lighting equipment - passenger cars	"
109	Pneumatic tires	"
110	Tire selection and rims	"
111	Rearview mirrors	"
111A	Rearview mirrors - passenger cars	"
112	Headlamp concealment devices	"
113	Hood latch system	"
114	Locking system	"
115	Vehicle identification number	"
116	Hydraulic brake fluid	"
118	Power windows	14/07/71
120	Tire selection & rims for vehicles other than passenger cars	4/04/79
121	Air brake systems
122	Motorcycle, motor driven cycle & moped brake systems	22/01/81
123	Motorcycle controls & displays	26/06/79
124	Accelerator control systems	12/12/73
201	Occupant protection	13/01/71
202	Head restraints	"
203	Driver impact protection	"
204	Steering column rearward displacement	"
205	Glazing materials	"
206	Door latches, hinges and locks	"
207	Anchorage of seats	"
208	Seat belt installations	"
	- 3 point belt requirements	12/12/73
	- Air bag system maintenance	
	- Air bag system requirements	24/07/74
	- Passive seat belt requirements	23/10/74
	- Seat belt warning system requirements	12/02/71

TABLE I: CANADIAN FEDERAL VEHICLE SAFETY STANDARDS

Title		Effective Date
209	Seat belt assemblies	13/01/71
210	Seat belt assemblies anchorages	"
211	Wheel nuts, hub caps and wheel discs	"
212	Windshield mounting	"
213	Child seating and restraint systems	24/10/73
213.1	Infant restraints	3/06/82
214	Side door strength	27/12/72
215	Bumpers	26/07/72
216	Roof intrusion protection	14/03/73
217	Bus window retention release and emergency exit	14/08/74
218	School bus rollover protection	26/10/77
219	Windshield zone intrusion	19/08/81
221	School bus body joint strength	12/03/80
222	School bus passenger seating and crash protection	12/03/80
301	Full tanks, filler pipes & connections	13/01/71
301.1	Full system integrity (L.P.G.)	29/07/82
301.2	Full system integrity (C.N.G.)	29/07/82
302	Flammability	26/07/72

TABLE II: PROVINCIAL STANDARDS FOR VEHICLE
SAFETY EQUIPMENT

The following are the requirements for obtaining a safety inspection sticker to register a vehicle:

- | | |
|---------------------------------|---|
| 1. Body work | Reg. No. 483, s.1 including, ⁶⁸ <ul style="list-style-type: none">- bumper and fenders s.1(a)(b)(d)- hood and latch s.1(i)(e)- energy absorbing material s.1(i)- seat belt assemblies and anchorages s.1(i)(j)(k)(l)- emergency exits on buses s.1(l)(n)- safety requirements for physically disabled passenger vehicles s.1(i)(p)- doors s.1(2)(3)- chassis frame underbody and mounts s.1(4)- drive shaft s.1(5)- mirrors s.1(6)- windshields and windows s.1(7)- fuel system s.1(8)- exhaust system s.1(9)- fifth wheel coupling devices s.1(10)- trailer hitches |
| 2. Brakes s.2 | <ul style="list-style-type: none">- 2 working braking systems (regular brakes, and an emergency brake) <u>H.T.A.</u>, s.46(1)(2)(3)- must be in good working order <u>H.T.A.</u>, s.46(5). |
| 3. Engine Controls and Steering | <ul style="list-style-type: none">- acceleration control system s.3(1)- power steering s.3(3) steering column s.3(4)- front wheel alignment s.3(5)(6)(7) |
| 4. Suspension system | <ul style="list-style-type: none">- s.4 |

⁶⁸All section numbers refer to Regulation No. 483 of the Highway Traffic Act, R.S.O. 1980, c.198, as amended. Sections of the Highway Traffic Act itself are prefaced by " H.T.A.".

TABLE II: PROVINCIAL STANDARDS FOR VEHICLE
SAFETY EQUIPMENT (continued)

- | | |
|----------------------|--|
| 5. Electrical system | - horn s.5(1) |
| | - windshield washer system s.5(2) |
| | - heating and defrosting s.5(3) |
| | - neutral starting switch s.5(4) |
| | - speedometer s.5(5) |
| 6. Lighting | - headlight <u>H.T.A.</u> , s.44(1) to (18), Reg. 483. s.6 |
| | - plate lights <u>H.T.A.</u> , s.44(19) |
| | - parking lights <u>H.T.A.</u> , s.44(20) |
| | - trailer lights <u>H.T.A.</u> , s. 44(24) |
| 7. Tires and wheels | - s.7 |
| 8. Numbered plates | - s.8 |

Nfld.	Que.	Ont./N.S./N.B./P.E.I.	Man.	Sask.	Alta./Yukon	B.C.	N.W.T.
Third Party Liability (Bodily Injury and Property Damage) Compulsory in all provinces							
Minimum \$200,000	Minimum \$50,000 No limit on liability Insured within Quebec	Minimum \$200,000	Minimum \$200,000	Minimum \$200,000	Minimum \$200,000	Minimum \$200,000	Minimum \$50,000 (Effective Jan. 1, 1988 Min. \$200,000)
Medical Payments \$2000 per person excluding amounts under Government Medical & Hospital Plans Time Limit: 2 years	No one or amount limit Includes rehabilitation Government Health Insurance Time Limit: 4 years	\$25,000 per person including rehabilitation excluding Government Health Insurance Time Limit: 4 years	\$20,000 per person excluding Compulsory Health Insurance Scheme	\$10,000 per person discretionary to meet expenses	\$5000 per person including rehabilitation excluding Government Medical & Hospital Plans	\$100,000 per person to pay for medical expenses, excludes any amounts payable under surgical dental hospital plan or other insuror	\$2000 per person to pay for medical expenses, excludes any amounts payable under Government Medical & Hospital Plans
Funeral Expense Benefits							
\$500 maximum	\$2582.16 maximum	\$1000 maximum	\$1500 maximum	None	\$1000 maximum	\$1000 maximum	\$1000 maximum
Disability Income Benefits							
\$35.00 per week 104 weeks temporary 104 weeks permanent 7 day waiting period Housewife \$12.50 per week Max. 12 weeks	Max. \$157.32 per week or 80% of net wages Max. Income Gross \$35,500 per year Temporary: 5 years Permanent: lifetime 7 day waiting period Housewife N.S. N.B. & P.E.I.: 7 day waiting period Unpaid housekeeper \$10.00 per week Max. 12 weeks	80% of Gross Wages Max. \$140.00 weekly 104 weeks temporary Lifetime total @ \$75.00 7 day waiting period Other: first day cover 14 day waiting period N.S. N.B. & P.E.I.: 7 day waiting period Unpaid housekeeper \$10.00 per week Max. 12 weeks	\$150.00 per week or 70% of Gross Wages Max. \$300.00 weekly 104 weeks partial @ \$60.00 7 day waiting period Lifetime total \$150.00 weekly Partial \$60.00 weekly Max. 104 weeks	\$150.00 per week Lifetime total @ \$75.00 7 day waiting period Total \$75.00 weekly Max. 104 weeks	75% Gross Wages Max. \$145.00 weekly 104 weeks temporary or total Lifetime total & permanent 7 day waiting period Homemaker \$145.00 per week To Age 65 Spouse \$150.00 per week Max. 26 weeks	Employed Person Max. \$145.00 weekly Min. \$40.00 weekly 104 weeks temporary 7 day waiting period 7 day waiting period Housewife \$150.00 per week Max. 26 weeks	
Death Benefits							
Death anytime after accident Person to dependent Married Male: Age limits 60-68 - 3000 68-69 - 3000 70+ - 2000 \$1000 each dependent child No limit Married Female: Age Limit 10-59 - \$2500 60-69 - 1000 70+ - 1000 Unmarried Person with living parents: Scale by age Maximum \$2500	Death anytime after accident Person to dependent Age Limits: None Min. \$157.32 per week Without dependent \$8046.48 or \$4023.24 10-59 - \$2500 60-69 - 1000 70+ - 1000 Unmarried Person with living parents: Scale by age Maximum \$2500	Death within 2 years after accident Head of Household Age Limits: None \$10,000 each dependent Plus \$300 each dependent beyond first No limit Spouse No age limit Spouse No age limit Dependent Child \$2000	Death anytime after accident Head of Household Age Limits: None \$10,000 each secondary dependent Spouse No age limit \$10,000 Dependent Child Maximum \$2000	Death within 2 years after accident Head of Household \$5000 to primary dependents \$1500 each secondary dependent Spouse No age limit Equal division to surviving dependents Dependent Child \$2,500	Death anytime after accident Head of Household \$5000 plus 1% of total beyond first + 1% of total Principal Sum for 104 weeks No limit Spouse \$5000 Dependent Child Maximum \$1500	Death anytime after accident Head of Household \$5000 + 1% per week for 104 weeks Head of Household \$10,000 to 104 weeks Plus \$1000 + \$35.00 weekly for survivor beyond first No limit 20% of Principal Sum for each dependent No limit first Spouse Dependent Child Maximum \$1500 Age Limit 10-64 - \$2500 65-69 - 1000 70+ - 1000 Dependent Child Scale by age Maximum \$1500	Death anytime after accident \$5000 + 1% per week for 104 weeks Head of Household \$10,000 to 104 weeks Plus \$1000 + \$35.00 weekly for survivor beyond first No limit 20% of Principal Sum for each dependent No limit first Spouse Dependent Child Maximum \$1500 Age Limit 10-64 - \$2500 65-69 - 1000 70+ - 1000 Dependent Child Scale by age Maximum \$1500
Dismemberment Benefits							
Schedule based on 50% - 100% of Principal Sum	Scheduled up to \$39,328.13	Not included	Scheduled Benefits Maximum Deducted from death benefits	Scheduled Benefits Maximum \$10,000	Not included	Not included	Not included
Administration							
Private insurers	Government: bodily injury Private insurers: property damage	Private insurers	Compulsory Insurance Government Monopoly Optional and Excess Government and Private Insurers compete	Compulsory Insurance Optional and Excess Government and Private Insurers compete	Private insurers	Compulsory Insurance Optional and Excess Government and Private Insurers compete	Private insurers

• Alberta, Ontario and Manitoba residents involved in accidents in Quebec receive from their own insurer the equivalent to the benefits available to Quebec residents from the Régie.
• Accident Benefits Coverage is compulsory except in Newfoundland • Collision insurance is optional except in Manitoba (\$200 deductible) and Saskatchewan (\$500 deductible).

APPENDIX VII

A SELECT BIBLIOGRAPHY OF BOOKS, ARTICLES, REPORTS AND PAMPHLETS

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APPENDIX VIII

GLOSSARY OF INSURANCE AND RELATED TERMS

ACCIDENT FREQUENCY - The number of accidents related to the risk. Some risks are inherently "high frequency" risks as for example, most city transit systems. Other risks are "low frequency" risks which may go for a considerable length of time without reporting any accident but when an accident occurs, it is often quite a substantial one as for example, hydro electric systems.

ACCIDENT YEAR EXPERIENCE - Simplistically the matching of all losses occurring (regardless of when the losses are reported) during a given twelve-month period of time with all premiums earned (regardless of when the premiums were written) during the same period of time. More specifically, the total value (losses paid plus loss reserves) of all losses occurring during the defined twelve-month time period (i.e. the date of loss falls within the time period) is divided by the earned premium (see its definition) for this same exposure period. As the experience is developing, loss reserves are used in the calculation, but the ultimate result cannot be finalized until all losses are settled. While any twelve-month period can be used to define the exposure period, the year beginning January 1 is normally used. The most accurate method uses exposure earned premium (see its definition under EARNED PREMIUM) as the denominator, whereas in practice accounting earned premium (see its definition under EARNED PREMIUM) is frequently used as a matter of convenience.

ACTUARIAL RATES - Rates which are determined by using loss history, projections, and mathematical formulas.

ACTUARIAL SCIENCE - A scientific technique by which principles of mathematics are used to determine insurance rates. Factors considered include loss history, interest rates, and other costs projected over time.

ACTUARY - A person trained in the "principle of large numbers" and the "theory of probability" as it applies to the insurance business. He is usually a mathematician and his responsibilities are to calculate the proper premium rates based upon experience and often to consider the accuracy of the assessments of reserves.

ADDITIONAL INSURED - A person, other than the named insured, who is protected by the terms of the policy. Usually a specified individual such as a spouse or a member of the insured's family -- but sometimes, as in automobile insurance, any person provided he is driving the insured vehicle with the insured's permission.

ADEQUACY - A required characteristic of an insurance rate. The rate must provide sufficient funds to pay losses and expenses. Such rate adequacy is required by insurance laws to prevent insurer insolvency.

ADJUSTER - The person who investigates insured losses and negotiates the settlement of claim on behalf of the insurer. Public adjuster is one who, for a fee, represents policyholders in the adjustment of their losses with insurance companies.

ADJUSTMENT - The process of arriving at the settlement of a claim. It may consist of a series of computations in an uncomplicated fire loss or it may involve discussions of the degree of liability, quantum of damages and other matters in problem liability claims.

AFFIDAVIT - 1) A sworn statement. 2) A written statement in the name of a person known as the "deponent", who has voluntarily signed and sworn or affirmed to such a statement. Such statement is known as an affidavit.

AGENT - A person who is employed to act on behalf of another. An insurance agent usually has a contract with the insurance company to sell the insurance company's policies to the public, on behalf of the insurance company, and is paid a commission on such business.

AGENCY EXPERIENCE - Companies keep a record of the profitability of business through their individual agents. By comparing business written and losses incurred for all its agents, a company is able to assess the relative value of these agents to the company.

AGGREGATE - The dollar amount of insurance coverage during one specified period, usually 12 months, for all insurance losses sustained under a policy during such period.

ALIEN COMPANY (OR INSURER) - A company incorporated in a foreign country.

ANNUAL RETURN - Financial information that must be filed with a government department each year. Non-profit charitable institutions must file a financial return each year with the Department of National Revenue if they wish to maintain their tax-exempt status and their right to issue tax-deductible receipts to financial supporters. Unions and corporations in Canada, above a certain size, are required to file information annually under the Corporations and Labour Unions Returns Act. Federally incorporated companies have to file an annual return on their financial activities for deposit with the Department of Consumer and Corporate Affairs. Provincially incorporated companies are also required to file an annual return with the provincial government if they wish to maintain the privileges of incorporation.

ANNUITY - The payment of a regular pension or similar benefit for a specified number of years or for the lifetime of the beneficiary, paid out of an invested sum of capital. The proceeds of Registered Retirement Savings Plans are usually converted into an annuity known as a registered retirement income fund. The federal government began selling annuities in 1908 and stopped selling them in 1975. Before there were government pensions, annuities provided an important way for ordinary Canadians to put aside money for their old age. Now they are sold only by insurance companies.

APPRAISER - The person called upon to establish quantum or the extent of material loss resulting from a claim, or to assist in the underwriting of a risk, usually recognized as an expert in his field of endeavour, i.e. real estate, gemologist, automotive or industrial equipment. The independent appraiser is an independent businessman who represents many insurance companies, reporting to the adjuster or company. The staff appraiser represents one company exclusively and reports directly to that company. The adjuster's appraiser usually represents one independent adjuster and reports directly to that adjuster.

ARBITRATION - An arrangement for reaching agreement between two sides by which both sides submit their case to a committee or a person who generally is vested with the authority of giving a final answer to the dispute.

ARBITRATION CLAUSE - A clause in an insurance policy providing a means of resolving differences between the company and the policyholder without litigation. Usually, each party appoints an arbiter. The two thus appointed select a third arbiter, or umpire, and a

majority decision of the three becomes binding on the parties to the arbitration proceedings.

ASSIGNED RISK PLAN - A plan between insurance companies in certain areas to accommodate the poorer risks which would not normally be acceptable to an individual company.

In operation, the risk which is difficult to place is presented to an office designated for that specific purpose and is assigned to an insurance company which must write it. The assignments are made in proportion to the volume of business written by that particular company.

Since there is a certain amount of stigma about the insured whose risk is so poor that it must be "assigned", and the resulting delay in processing, the Assigned Risk Plan is now superseded in many areas with a "facility" plan. (See also: FACILITY PLAN).

ASSIGNMENT - The transfer of an interest from one party to another. Insurance policies are personal contracts and are not transferable except by consent of the insurance company.

AUTOMOBILE INSURANCE - A form of insurance protection indemnifying an insured for loss arising out of the ownership, use or maintenance of an automobile. A loss may arise out of his legal liability to others (commonly referred to as Bodily Injuries or Public Liability and Property Damage) or loss or damage to the vehicle arising out of collision, fire, theft or a number of other risks. Medical, surgical and hospital care for the insured and his passengers may also be included in the automobile insurance.

An Automobile Insurance policy can also be extended to insure the insured not only when driving his own vehicle but driving the vehicle of any other of the same type with the acknowledging consent of the owner of that car.

AUTOMOBILE LIABILITY INSURANCE - A form of liability insurance (See: LIABILITY INSURANCE) which is specifically designed to indemnify for loss incurred through legal liability for bodily injury and damage to property of others caused by accident arising out of ownership or operation of an automobile.

"AUTOMOBILE PROBLEM" - This involves the socio-economic necessity of an automobile, the magnitude of the exposure, the need for liability insurance, the social insurance

aspect, and the political appeal of the factors involved (safety, insurance, tort law).

AVERAGE - A single number that is intended to be typical of a series of numbers. For example, the average weekly wage is a figure that is representative of a wide range of individual weekly wages; the average selling price of a new home is representative of the different prices being charged for new homes.

Averages are useful because they give a more accurate picture of performance over periods of time, a picture that can be used as a standard in assessing short-term performance. For example, current inflation, unemployment, and gross-national-product growth rates are better understood if they are measured against the average of the past five or ten years. Averages also give a truer picture, in the sense that they smooth out the effects of short-term fluctuations such as bad weather or an industrial dispute.

There are different methods of calculating average figures. The most commonly used average is the simple average, which is produced by taking a series of numbers, adding them together, and dividing the total by the number of numbers; for example, if a country had, in a five-year period, inflation rates of 6.7, 7.4, 8.9, 9.3, and 8.2, its average annual inflation rate would be 8.1 per cent. A weighted average is calculated in a similar fashion, except that the relative importance of different components of the average are taken into account. For example, in calculating the Consumer Price Index (CPI) which represents an average of a typical bundle of consumer purchases in a month, more weight is given to food costs, which represent a large element of a family's budget, while a relatively small weight is attached to recreational spending.

BANK RATE - The rate of interest the Bank of Canada charges to the chartered banks and to money-market dealers for their infrequent loans. The chartered banks can borrow from the Bank of Canada as a last resort, usually for just a few days. A bank, for example, may need a one-million-dollar loan for a day or two to maintain its minimum cash balance until its cash position has improved. The bank rate is more important, though, as a signal to the banking system on the direction of monetary policy. An increase in the bank rate is normally a sign that the Bank of Canada plans to tighten the money supply. This in turn will lead to an increase in interest rates charged by the chartered banks and other financial

institutions to their customers. A drop in the bank rate is normally a signal that the Bank of Canada intends to relax monetary policy, and the bank system will respond by lowering interest rates. The Bank of Canada will follow up changes in the bank rate with other actions to increase or decrease money supply.

The speed with which the banking system responds to changes in the bank rate depends on the state of financial markets. For example, increases in the bank rate may not be followed by immediate increases in mortgage interest rates if there is an abundant supply of mortgage funds and a shortage of customers for mortgages. But, if higher interest rates were to continue for some time, mortgage lenders would have to raise their rates as well. Increases in the bank rate, and hence in lending rates in the banking system, also mean that banks and other financial institutions have to pay higher interest rates to their depositors.

The U.S. equivalent to the bank rate, set by the Federal Reserve Board in Washington, is the discount rate.

BARRIERS TO ENTRY - Market obstacles that inhibit or prevent the entry of new firms into an industry and thus restrict competition. Economies of scale in capital-intensive industries restrict entry; there are high start-up costs and a new competitor will have to have a high level of production to be price-competitive. Unless he thinks he can justify those high start-up costs, a would-be competitor in a capital-intensive industry will be reluctant to make the investment. But deliberate anti-competitive policies by existing producers - such as product differentiation based on a large investment in advertising, exclusive-dealing contracts with retailers, and patent restrictions - also make it extremely difficult for a new firm to enter an industry. Similarly, government regulation can be a barrier to entry; for example, farm marketing boards make it difficult for new agricultural producers to enter the market, while government licensing requirements restrict the entry of new radio, television, and airline services.

Where there are significant barriers to entry, existing producers may be able to earn excess profits; but if there is relative ease of entry, then profit margins are likely to be lower. The barriers to entry represent the costs that would-be producers must overcome; their existence usually means, unless there is relative ease of entry, that new producers have higher costs, at least on first entering the industry, than do existing producers.

A country that wants to increase competition has to find ways to reduce barriers to entry in many industries, by changing patent laws, for example, or by outlawing exclusive dealing and other such arrangements. (See also: CONTESTABLE MARKET).

BASE PERIOD - A selected month, year, or set of years used in calculating an index number or growth rate. Statistics Canada uses 1971 as its base year for most indexes and in calculating changes in CONSTANT DOLLARS or in real terms. If 1971 is the base year (1971 = 100) and the consumer price index is 193.8, then consumer prices have risen 93.8 per cent since 1971. Similarly, if 1971 is the base year and the gross national product has risen by 49 per cent in 1971 dollars (after inflation has been deducted for the period), then real growth or growth in physical output has been 49 per cent.

BENEFICIARY - The one to whom the proceeds of a policy are to be paid as set forth in its terms.

BENEFITS - The amount paid under an insurance contract. (See also: PRIMARY BENEFITS).

BROKER - An independent agent who brings together a buyer and a seller so that a sale can be made. There are many different kinds of brokers, each with specialized knowledge of his market: in shares traded on a stock exchange, the stockbroker; in property (such as houses or commercial buildings), the real-estate broker; in commodities (such as wheat and porkbellies), the commodities broker; and in insurance, the insurance broker. For their services, brokers are paid a commission (See: BROKERAGE), which is usually related to the value of the transaction. Like the agent, the broker is licensed in the province or provinces in which he conducts his business.

BROKERAGE - The fee or commission charged to a customer by a stockbroker, commodity dealer, real-estate agent, or other kind of broker.

CALENDAR YEAR EXPERIENCE - 1) Simplistically, the matching of all losses incurred (not necessarily occurring) within a given twelve-month period, usually beginning on January 1, with all premiums earned within the same period of time. Incurred losses will include the change in Incurred But Not Reported (IBNR). More specifically, the total value of all losses incurred (not necessarily occurring) during the calendar year is divided by the accounting earned premium for this same exposure

period. Losses incurred are equal to the sum of losses paid, plus the outstanding loss reserves at the end of the year, less the outstanding loss reserves at the beginning of the year. Once calculated for a given period, calendar year experience never changes.

2) Experience of premium and incurred loss transactions actually occurring within the calendar year beginning January 1 irrespective of the contractual dates of the policies to which the transactions relate.

CANCEL - To terminate a contract. Usually applied to the termination of a policy before its natural expiration, but may be used to describe the ending of any contract during its natural life, such as an agent's contract.

CANCELLATION - The termination of the policy before the end of a policy period. Usually if the company cancels the policy, the insured is entitled to a pro rata return of premium for the unused portion of the policy. If the insured cancels, he is entitled to a reduced refund of premium.

CAPACITY - The measure of an insurer's ability to issue contracts of insurance. Measured usually by the largest amount it will accept on a given risk or, in certain other situations, by the maximum volume of business which the company is prepared to accept.

CAPTIVE AGENT - An agent who places all his business with one insurance company is known as a "captive agent". In some instances he may be a salaried employee of the company although in others he may be selling the insurance on a commission basis, but has a contract to write only business that would be acceptable to the one insurance company. Sometimes called "exclusive agent".

CARRIER - 1) The insurance company which provides the protection for a particular risk. 2) A transporter of goods. A common carrier is one which is available to the public for the transport of any goods. A contract carrier works under long-term contract for one or more shippers. A private carrier transports only the goods of its owner. (Lenz)

CASH FLOW - The funds available to a company to pay dividends and finance expansion. It is calculated by adding together net earnings or after-tax profits (before extraordinary items), all deductions that do not require an actual cash outlay, such as depreciation, depletion allowances, or deferred income taxes, and any minority interest in the earnings of another company. Since it

includes tax deductions that do not require an actual cash outlay, the cash-flow figure gives a more useful picture of a company's financial position than net earnings or after-tax profits alone.

CASUALTY INSURANCE - The group of coverages which includes insurance against liability claims and almost all other types except fire, marine and life.

CERTIFICATE OF INSURANCE - A certificate of insurance is, in the usual sense of the word, a copy of a policy.

CLAIM - The amount which a policyholder believes he has coming from an insurance company as the result of some happening insured against. After its amount has been determined, it becomes a "loss". In practice, the terms "claim" and "loss" are synonymous.

CLAIM DEPARTMENT - The department of a company dealing with losses or claims made by the policyholders.

CLAIM EXPENSES - The costs incurred in processing claims: court costs, interest upon awards and judgments, the company's allocated expense for investigation and adjustments and legal expenses (excluding, however, ordinary overhead expenses of the company such as salaries, monthly or annual retainers, and other fixed expenses which are defined as unallocated loss adjustment expenses). Also known as Loss Expenses or Loss Adjustment Expenses.

CLAIM RESERVE - The amount of money set aside by an insurance company for a reported claim that has not been settled.

CLAIMS-MADE BASIS - The provision in a contract of insurance or reinsurance that coverage applies only to losses which occur and claims that are made during the term of the contract. (Losses occurring before the contract term are sometimes covered by the addition of "prior acts" coverage by the addition of "tail" coverage). Once the policy period is over in claims-made covers, the approximate extent of the underwriter's liability is known. On the other hand, the traditional "occurrence" liability insurance method provides coverage for losses from claims which occurred during the policy period regardless of when the claims are asserted. With the traditional "occurrence" liability coverage method, the underwriter may not discover the extent of liability for years to come from losses asserted to have occurred within the policy period. With claims-made covers which

are renewed, however, losses which occurred during any period when the policy was in force are again covered if reported during the renewal term. In summary, the traditional method is similar to claims-made if the latter has added to it both "prior acts" and "tail" coverage.

COLLATERAL - Accompanying as a side or secondary fact, or acting as a secondary agent; subsidiary; indirect. Related to or not strictly a part of the main thing or matter under consideration.

COMMISSION - In insurance an amount paid an agent for insurance placement services. (See also: **BROKERAGE**).

- **BROKERAGE COMMISSION** - An amount paid a broker for insurance or reinsurance placement services.

- **CEDING COMMISSION** - In reinsurance an allowance (usually a percentage of the reinsurance premium) made by the reinsurer for part or all of a ceding company's acquisition and other costs. The ceding commission may also include a profit factor for the reinsured.

- **OVERRIDING COMMISSION** - a) A fee or percentage of money which is paid to a party responsible for placing a retrocession of reinsurance, b) In insurance a fee or percentage of money which is paid by the insurer to an agent or general agent for premium volume produced by other agents in a given geographic territory.

- **OVERWRITING COMMISSION** - Another name for Overriding Commission.

- **PRODUCER COMMISSION** - The same as Brokerage Commission.

- **REINSURANCE COMMISSION** - The same as Ceding Commission.

COMPETITION - A market in which rival sellers are trying to gain extra business at one another's expense, and thus are forced both to be as efficient as possible and to hold their prices down as much as possible. Competition is thus a sophisticated yet uncoordinated mechanism that sorts out the actions of millions of buyers and sellers, and uses the resulting pattern of supply and demand to determine what shall be produced, in what quantities, and at what price.

Insofar as competition exists, it is an effective way of achieving the efficient allocation of resources and the lowest cost for goods and services. Much of classical and neoclassical economics is based on the notion of perfect

competition, in which numerous firms sell identical goods and therefore have to hold down prices. But the real world of the modern mixed economy is one of imperfect competition, where large firms are able to exercise a significant control over prices and where the barriers to entry prevent new firms from entering the industry and competing by selling at lower prices.

COMPETITION POLICY - Legislation that protects the consumer against unfair business practices and the exploitation by oligopolies and monopolies of their excessive market power to charge high prices and curb competition. Thus, the purpose of competition policy is to improve the efficiency of the marketplace and to promote competition. Among the specific practices covered by competition law are collusion among competitors to fix prices, to allocate market, or to prevent the entry of new firms, or takeovers of competitors to reduce competition and achieve monopoly power, resale-price maintenance to prevent lower prices, misleading advertising, and other restrictive practices.

COMPREHENSIVE - A word commonly used preceding the description of the type of policy issued to designate that the particular policy is broader in form than the earlier policies issued by the same company. The increase is generally an increase of the scope of the contract or extension of it into additional perils or both.

COMPREHENSIVE AUTOMOBILE INSURANCE - This type of automobile insurance provides coverage to repair your car when it is damaged in circumstances other than by a collision, e.g. fire, theft, vandalism, glass breakage, etc.

COMPULSORY AUTOMOBILE INSURANCE - Many jurisdictions in Canada and the U.S.A. require evidence of the existence of valid third party liability automobile insurance before a motor vehicle permit will be issued or renewed. In some jurisdictions, accident benefits and collision coverages may also be compulsory.

CONCENTRATION RATIO - The percentage of shipments, employment, assets, or profits accounted for by the four largest establishments or four largest enterprises within a group of competing firms. Three common measures are used: 1. The inverse index, which shows the number of firms or establishments that account for 80 per cent of factory shipments or employment in a particular industry. 2. Industry concentration ratios, which show the

percentage of the value of shipments accounted for by the largest 4, 8, 12, 16, 20 and 50 enterprises or establishments in a particular industry. 3. The Herfindahl Index, which measures concentration in terms of employment and shipments added together.

CONFLICT OF INTEREST - A situation in which the interest of one person and the interest of someone else (including a financial institution) acting on behalf of that person are at variance. Such a situation can also occur when someone, acting on behalf of several customers whose interests are at variance, must choose (or at least has the opportunity to choose) to serve the interest of one over the interest of the others.

CONSTANT DOLLARS - A statistical term designed to show physical changes in output, income, profits, or sales by adjusting dollar values for a year, or a series of years, for inflation. For example, the gross national product (GNP) for 1980 can be expressed either in current 1980 dollars or in constant dollars with, say, 1971 as the base year. The constant-dollar figure will deduct all the inflation of the period 1971-1980 and show the GNP in terms of 1971 purchasing power, or as the real growth of the economy. Such an exercise is useful in showing the real changes taking place in output, income and other economic measures, especially in times of high inflation; it shows the real changes that have occurred, as opposed to the changes that simply reflect inflation.

CONSUMER PRICE INDEX (CPI) - A monthly measure of changes in the retail prices of goods and services purchased by Canadians living in all parts of the country in communities with a population of thirty thousand people or more. The index is based on the shopping basket of three hundred goods and services, that, in 1967, families of from two to six people, with annual incomes of four to twelve thousand dollars, would normally buy. It is a weighted index, which attributes greater importance to price changes for food and housing, for example, than to price changes for bus tickets and movie-theatre admissions. The CPI is published monthly for Canada and for fourteen major cities, using 1971 as the base year (1971 = 100). Price changes can be broken down into sub-groups - as, for example, they affect goods and services, food and non-food prices, or any of the individual sectors measured. A seasonally adjusted monthly consumer price index is also produced, showing inflation trends. Generally, it is the CPI that is used in COLA clauses and in indexation of the income-tax system, or of social benefits such as the old-age pension.

CONTESTABLE MARKET - A market into which there is a freedom of entry and from which exit is absolutely costless. (See also: BARRIERS TO ENTRY).

CONTINGENT LIABILITY - A commitment to make a payment that is contingent on a specified event taking place - e.g., a guarantee that a loan would become payable by the guarantor in the event that the borrower were to default.

CORPORATE GOVERNANCE - A form of regulation internal to the institution. The management and directorate of a financial institution are structured, and internal rules and regulations are formulated, so as to achieve the desired corporate behaviour. An example is the institution of, and powers given to, committees of boards of directors to supervise various aspects of the business of financial institutions. Audit committees and committees to oversee non-arm's length transactions are cases in point.

CROSS-REFERRAL - The referral of potential customers by one institution to another, for further servicing of their needs.

CROSS-SELLING - A form of networking in which the agent of one financial institution sells the products of another institution.

CUT RATE - A rate less than the published or standard rate.

DAILY REPORT - A copy of a policy which is used as the agent's or the company's record. The most used record in a company office.

DAMAGES - A sum of money claimed or awarded as compensation for loss or injury.

DEDUCTIBLE CLAUSE - Some policies are written to pay only after the policyholder has himself suffered an agreed amount of loss. The amount which he must lose first is "deducted" from the total of the damage to determine the amount the company must pay and thus becomes the "deductible".

DEGREE OF RISK - This reflects the accuracy with which the occurrence of loss can be predicted. It is measured by the probable variations of actual loss experience from expected loss experience. The lower this variation the smaller the risk becomes. The greater the number of

exposures in the group studied the more predictable and the smaller the percentage variation or degree of risk.

DIRECT GOVERNMENT REGULATION - An approach to regulation in which the rules and regulations governing the behaviour of financial institutions are set down in law by government, and government officials ensure compliance with those rules. The Bank Act, the operations of the Office of the Inspector General of Banks and of the Ontario Loan and Trust Corporations Act, and the Ontario Ministry of Financial Institutions are examples.

DIRECT WRITTEN PREMIUM - The gross premium income (written instead of earned) of a primary company adjusted for additional or return premiums but before deducting any premiums for reinsurance ceded and not including any premiums for reinsurance assumed.

DISABILITY -Loss of Income - usually associated with accident health policies, workmen's compensation or employer's liability policies. Certain benefits are payable for the period of disability. In accident and health most companies restrict such income payments to a portion percentage-wise of the insured's current earnings and with a top dollar limit of say \$500.00 or \$1,000.00 per month.

- **TOTAL TEMPORARY DISABILITY** - Is where the disability is such as to make the party unable to carry out any part of his normal work, but for which recovery is expected.

- **PARTIAL TEMPORARY DISABILITY** - Is where the party is unable to put in a full time job but is nevertheless able to perform one or more of his normal work obligations. Full recovery in due course is to be expected.

- **TOTAL PERMANENT DISABILITY** - Is a disability that permanently disables the party from resuming his normal gainful employment.

- **PARTIAL PERMANENT DISABILITY** - Is the impairment of the use of some function of the body as for example the loss of a finger which lessens the efficiency of the individual but nevertheless does not preclude him entirely from earning a living.

DISABILITY BENEFITS INSURANCE - A form of coverage which provides benefits to employees disabled by sickness or accident not related to employment.

DISCOUNT BROKER - Discount brokers buy and sell securities for their clients at a reduced rate of commission. Unlike full-service brokers, discount brokers do not provide investment advice.

DOG - The popular name for a risk that almost nobody wants to accept.

DRIVE-IN CLAIMS SERVICE - A system employed by automobile insurers whereby vehicles with minor insured damage, can be driven to the company's local "drive-in" Claims Office for inspection and immediate settlement of the damage claim.

DRIVER TRAINING CREDIT - To encourage driver education courses at schools and colleges, many insurers grant premium rebates to applicants for private passenger automobile insurance who have successfully completed an approved training program.

EARNED PREMIUM - That portion of written premium equal to the expired portion of the time for which the insurance or reinsurance was in effect. Technically, the following definitions are appropriate.

- **ACCOUNTING EARNED** - This is the most common and widely understood method. The unearned premium reserve at the beginning of the period is added to the premium written (booked) during the period and the unearned premium reserve at the end of the period is subtracted. Accounting earned is the figure used in the annual statement.

- **EXPOSURE EARNED** - This method calculates the premiums which were actually exposed to loss (earned) for the period. The date on which premiums were booked is disregarded. What is significant is the effective date and term to which the premium applies. The portion of the premium written which was exposed to loss (earned) is allocated to the exposure period whether the premiums were booked prior to the period, during the period or after the period. The exposure earned premium eliminates the deficiency contained in accounting earned premium that results from timing problems in the recording of premium records.

ECONOMIES OF SCALE - Reductions in the average cost of production, achieved by increasing the volume of output and thus using the various factors of production more efficiently. By making use of advanced machinery, specialized labour, interchangeable parts, automation,

large-scale distribution, and ongoing research and development, a firm should be able to produce a product much more efficiently. But these economies can only be achieved when the volume of production is high enough to justify the heavy capital investment and extensive division of labour; when production is high enough, the big, capital-intensive, highly specialized plant can produce at a much lower average cost than a similar smaller plant.

This explains why, in many modern industries such as petrochemicals, mineral processing, computers, automobile assembly, and telecommunications, it is hard for small companies to survive, and why it is important to have access to large markets. In many instances, where the costs of innovation and of capital equipment are so high, access to large markets is essential if the benefits of economies of scale are to be achieved - or indeed, the investment in a new plant made. At some point, when marginal cost equals average cost, a plant will stop yielding economies of scale; it will then be at a point where diseconomies of scale begin, with each extra unit of output costing more than the average cost and thus being unprofitable. In other words, a plant can produce both too little and too much.

EFFECTIVE DATE - The date upon which a policy first becomes liable to pay a loss. The starting date.

ELEMENTS OF AN INSURANCE CONTRACT - The essential elements of an insurance contract are the same as those of any legal contract. These include: offer and acceptance (the agreement); competent parties; legal purpose; and consideration. However, an insurance contract also may be divided into four basic parts. These are: Declarations, Insuring agreement, Conditions, and Exclusions (the D-I-C-E provisions).

ENDORSEMENT (or INDORSEMENT) - Endorsements, sometimes called indorsements, appear as extra slips of paper attached to a policy indicating that the written consent of the parties has been given to a change in the terms of the original contract and an avowal that such change will not affect the insurance. They should always be added to the policy not any renewal slip.

Note the distinction from a rider which is the addition of a new peril to a policy and in effect, therefore, an additional insurance policy combined with the original.

EQUITY - In insurance regulation equity means equity toward the consumer and it is defined as reasonableness, impartiality, and fairness. In insurance rates this means that the rates do not unfairly discriminate against either insured or insurer. When rates are equitable all insurers pay their fair share of projected claims and expenses. Complete equity would be impossible because of the uniqueness of exposures thus groups or classes are used.

EQUITY CAPITAL - The capital in a firm that represents ownership. The owners of the equity capital - the firm's common shares - are entitled to all the assets and income of the firm after all the claims of creditors have been paid.

EXAMINATION - A check of the affairs of the insurance company and its general practices by governmental authority. The check is usually more in the nature of an audit.

EXCLUSION - Something not covered and so set forth in the wording of a policy.

EXPENSE RATIO - The percentage of premium used to pay all the costs of the insurance company in writing and servicing the business including agent's commission as a ratio to the premium itself.

EXPERIENCE - As used in insurance, the financial record of a policy or class of business. A policy or class of business in which the losses have been modest is described as having been "good experience". Where losses are high the term "poor experience" is used. Statistically the "experience" on an individual risk is obtained by comparing the losses with the premium, usually over a period of years. The experience of a class of business, a territory, an agency, etc. is obtained by a similar comparison as applied to them.

EXPERIENCE RATING PLAN - This is a method of rating which provides that the experience (good or bad) of an individual firm can have an effect on its rates.

EXPIRATION - A policy "expires" when the time for which it was written has run out. "Expiration" is the date on which it expires.

EXPOSURE - 1) The danger of loss (particularly by fire) arising from what happens to another risk close by. 2) Also the sum total of values which if damaged or destroyed

would cause loss under a policy, i.e., the value of everything a policy insures.

3) Also used as a measure of the rating units or premium basis of a risk, e.g., payroll exposure or an exposure of a number of automobiles.

EXTENDED COVERAGE - An endorsement that enlarges the coverage afforded by the primary policy. In fire policies, the "Extended Coverage" adds still more perils such as accidental leakage of plumbing and heating systems, vandalism, etc.

FACILITY PLAN - A plan for assuring a market for the poorer automobile risks.

In areas where the plan is in operation, the "facility" enables all companies to take whatever risks are prescribed by their underwriting policy and wherever there is a risk that is considered to be substandard by the underwriter, 85 per cent of it may be transferred to the "facility" and 15 per cent retained. In certain extreme cases of a bad accident or convictions experience or both, the facility would accept 100 per cent of the risk. The "facility" is underwritten by all the insurance companies and thus the insurance companies share the poorer risks and are prorated in dollars rather than prorated in assignment of the individual risks to individual companies. (See also: Assigned Risk Plan).

FAMILY AUTOMOBILE POLICY - A broad form combination policy for family use.

FIXED COST - Costs that do not change in a business, at least in the short run, regardless of the level of production. Such costs, often described as overhead, include rent, maintenance, interest, property taxes, insurance and administrative salaries. Even if production fell by 50 per cent, these costs would remain the same. However, if it appeared that production would remain much lower for a long time, then some of these costs could be reduced. Some administrative staff might be fired; or the firm could move to a smaller building and save on rent, maintenance, insurance, and property taxes. (See also: VARIABLE COST).

FLAT RATE - A gross premium is at times referred to as a "flat rate" and from this, deduction is allowed for co-insurance, etc.

FOREIGN INSURER - See: ALIEN COMPANY

FULL COVERAGE - An insurance policy without a deductible provision.

GRACE PERIOD - The period of time following the renewal date of an insurance policy, during which the premium may be paid without any extra expense or penalty.

"GREEN BOOK" - An annual automobile experience exhibit produced for government by the statistical arm of Insurance Bureau of Canada.

GROSS UP - To add back to the value of the property or income received the amount of the tax that has been deducted.

INCURRED BUT NOT REPORTED (IBNR) - A phrase referring to losses which have occurred but have not been reported to the insurer or reinsurer.

INCURRED CLAIMS - The figure for incurred claims is arrived at as follows:- Outstanding claims at end of period, plus paid claims (including external adjustment expenses), plus internal claims expense adjustment, minus salvage and subrogation recoveries, minus outstanding claims at beginning of period, equals incurred claims.

INCURRED EXPENSE (OTHER THAN LOSS EXPENSE) - An expense which has happened but which may or may not have been paid.

INCURRED LOSS RATIO - The relationship between incurred losses and earned premium, usually expressed as a percentage.

INCURRED LOSSES - 1) In insurance accounting an amount representing the losses paid plus the change (positive or negative) in outstanding loss reserves within a given period of time. 2) Losses which have happened and which will result in a claim under the terms of an insurance policy or a reinsurance agreement.

INDEXATION - The adjustment of pensions, wages, social-assistance benefits and income tax rates for inflation. The reason for adjusting pensions, wages, and social-assistance benefits is to ensure that there is no decline in the real purchasing power of these payments as a result of inflation. Similarly, Canada's income tax system has been indexed since 1973; the basic exemptions and the rate schedule are adjusted for inflation so that taxpayers are not pushed into higher tax brackets as their

pay goes up, unless they have a real increase in their income.

INELASTIC DEMAND - Demand that shows little change as a result of a price change. An increase in price will not reduce demand by much; a reduction in price will not increase demand by much. The demand for life's necessities is inelastic; for example, no matter how much producers lower the price of sugar or bread, it is unlikely that they can increase the demand very much; even with an increase in price, consumers will continue to buy the product unless the price rise is significant, persists, and there is a ready and acceptable substitute (tea instead of coffee, for example).

INELASTIC SUPPLY - Supply that shows little change as a result of a price change. An increase in the price will not increase the supply by very much; a reduction in price will not reduce the supply by very much.

INSURABLE INTEREST - "To make insurance policies legal and valid, the insured must possess such an interest in the subject of insurance as may be sufficient to involve him in a monetary loss, should the subject be damaged or destroyed." In other words, if he has a direct monetary interest in the property to be insured, he has insurable interest. This interest may be of various character; it may be that of an owner, of a lessee, of a guardian, a bailee, an executor, administrator, bailiff or sheriff, a creditor. As long as there is a real monetary interest, there is an insurable interest.

INSURANCE - Is the undertaking usually by a company specializing in such undertakings to indemnify another person against loss or liability arising out of certain perils.

INSURANCE AGENT - See: AGENT

INSURANCE BROKER - See: BROKER

INSURANCE POLICY - See: POLICY

INSURED - One who transfers a risk to another. The person named in the agreement of indemnity from an insurance company (or person) affording them indemnity from perils as set out therein. Interchangeable with "assured".

INSURER - The insurance company which has agreed to

accept the risk and to supply the indemnity to an insured in the event of loss.

INSURING CLAUSE - The part of the insurance policy which sets out the specific agreement to protect against the particular peril for which the insurance is purchased. It is an essential part of all insurance contracts.

INVESTMENT INCOME - Money earned from invested assets. May also include realized capital gains, or be reduced by capital losses over the same period.

KEETON-O'CONNELL PLAN - A plan for compensating automobile accident victims on the basis of making good their economic loss--wages, medical expenses, etc.--without the usual legal proof of negligence. Devised by Professors Robert E. Keeton and Jeffrey O'Connell; it is too complex for a simple definition. This and similar plans come under the broad definition "No-Fault Auto Insurance".

LAPSE - Where a policy has been allowed to run for its determined time and has not been renewed, the policy is said to have lapsed.

LAW OF LARGE NUMBERS - A mathematical concept which postulates that the more times an event is repeated (in insurance, the larger the number of homogeneous exposure units) the more predictable the outcome becomes. In a classic example, the more times one flips a coin the more likely that the results will be 50% heads, 50% tails.

LEGAL LIABILITY - The responsibility imposed under law upon one person to another whether by negligence (common law) or by statute or contract.

LIABILITY - A responsibility of one person to another enforceable in law. (See also: **LEGAL LIABILITY**).

LIABILITY INSURANCE - Provides protection for the insured against loss arising out of his legal liability resulting from injuries to other persons or damage to their property.

LOADING - An amount added to a basic rate. Loading in insurance is not an uncertain figure just cooked up to get a higher premium. In determining a rate, for example, the statistics produce a certain rate for a certain risk against a certain peril. However, the insurance company has to secure the business and administer the distribution of the money and for that

purpose there is a definite ascertainable cost. When that figure is added to the basic rate it is called "Loading".

LOSS - 1) In insurance it means the amount the insurer is required to pay because of a happening against which it has insured. 2) A happening that causes the company to pay. 3) Also refers to the overall financial result of some operation, as opposed to "profit".

LOSS OR DAMAGE - Loss is technically distinguished from damage in fire insurance when all or any portion of the property insured is consumed. "Loss" designates that portion which is entirely consumed, while "damage" designates that part of the property which is not consumed, but remains after a fire in a damaged condition.

LOSS RATIO - Proportionate relationship of incurred losses to earned premiums expressed as a percentage.

LOSS RESERVE - For an individual loss, an estimate of the amount the insurer expects to pay for the reported claims. For total losses, estimates of expected payments for reported and unreported claims. May include amounts for loss adjustment expenses. [See also: INCURRED BUT NOT REPORTED (IBNR) and INCURRED LOSSES].

LOSSES OUTSTANDING - Losses (reported or not reported) which have occurred but have not been paid.

LOSSES PAID - The amounts paid to claimants as insurance claim settlements.

LUMP-SUM DEATH PAYMENT - A method of payment of the benefit in the event of the insured's death. In life insurance it is the payment of the face amount, in cash, less any loans outstanding or premiums due the insurer. It is paid to a designated beneficiary otherwise to the insured's estate.

MEDIAN - An average calculated by taking the middle number in a range of values. For example, in determining median income, the numbers are arranged by size and the middle number picked as the median number, assuming that there is an odd set of numbers. If there is an even set of numbers, then the two central numbers (the second and third if there are four numbers, or the 13th and 14th if there are 26 are added together and divided by two. Suppose there are 400 families and that 110 have an annual income of \$10,000; 100 get \$12,500; 100 get \$13,750; 50 get \$15,000; and 40 get \$15,500. The median income is

\$13,750. Suppose, instead, that there are 360 families and that 110 get an annual income of \$10,000; 100 get an annual income of \$12,500; 100 get an income of \$13,750; and 50 get an annual income of \$15,500. Since there is not a middle number, the second and third numbers (\$12,500 and \$13,750) are added together and divided by 2, yielding a median income of \$13,125.

MERIT RATING - A system of rating whereby the insured with a good experience obtains benefits at a lower rate. Commonly used in automobile insurance where an accident-free driver for a certain period of time is given a discount from a listed rate he would otherwise pay. (See also: **SAFE DRIVER RATING PLAN**).

MODIFIED NO-FAULT - This is one type of no-fault automobile plan. The modified plan permits tort actions when the loss exceeds a pre-stated threshold. This threshold can either be based on the type of injury or the amount of medical expense. Most plans now in effect are of this type. [See also: **NO FAULT (AUTOMOBILE) and THRESHOLD**].

NEGLIGENCE - The omission to do something which a reasonable man would in similar circumstances have done, or the doing of something which a reasonable man in such circumstances would not do.

To recover damages against another in negligence there are three requisites:

- (1) There must be a legal duty on the part of the defendant.
- (2) The defendant must have failed to perform that duty.
- (3) There must be damage caused to the plaintiff as a result of that failure to perform by the defendant.

- **ACTIONABLE NEGLIGENCE** (or legal negligence) - Negligence that results in damage to person or property thus giving right of action against the negligent person.
- **COLLATERAL NEGLIGENCE** - Negligence of one person in a group to another person in same group, e.g. one employee injures another.
- **COMPARATIVE NEGLIGENCE** - Laws in many jurisdictions diminish the amount recoverable in a negligence action by the percentage of negligence contributing

to the loss by the person making the claim. In some jurisdictions, this is referred to as contributory negligence (laws correcting the original principle of contributory negligence). To illustrate a typical operation of such laws, a plaintiff is making a claim against a defendant in regard to damages to his automobile in an accident but it is found the plaintiff's negligence contributed 25 per cent to the accident and the defendant's negligence 75 per cent. The plaintiff would only have the right to collect 75 per cent of his damages since he himself contributed to the extent of 25 per cent. If there were a counter claim, the defendant could collect 25 per cent of his damages from the plaintiff. The remainder would be the responsibility of the defendant since he contributed 75 per cent toward the loss.

- CONTRIBUTORY NEGLIGENCE - At common law, a plaintiff is required to come in to court "with clean hands" (with no negligence on his own part). If by ordinary care, the accident could have been avoided or if some small negligence on the part of the plaintiff contributed to the accident, he has no right of recovery.

This is still the law in all areas where specific legislation has not been passed to change it. The legislation enabling the apportionment of liability, however, is sometimes called "contributory negligence laws" and in other areas "comparative negligence laws" which are, therefore, sometimes confusing.

- CRIMINAL NEGLIGENCE - Offences of negligence for which there are penalties provided in the Criminal Code.
- GROSS NEGLIGENCE - A complete lack of regard for the safety of others.
- ORDINARY NEGLIGENCE - Something less than the degree of care that would be exercised by an ordinary man in similar circumstances.

NET PREMIUMS WRITTEN (of a property or liability insurer)
- This is the retained premium income. That is, total premium less any premiums ceded to a reinsurance company.

NO FAULT (AUTOMOBILE) - A common description of insurance which will pay the insured person and others involved in accidents without determining his degree of fault.

Examples are collision insurance and the limited accident benefits.

OMBUDSMAN - 1) A government official (as in Sweden or New Zealand) appointed to receive and investigate complaints made by individuals against abuses or capricious acts of public officials. 2) One that investigates reported complaints (as from students or consumers), reports findings, and helps to achieve equitable settlements.

OPPORTUNITY COST - A term that describes the benefits sacrificed by taking one course of action instead of another. It is an economic rather than an account concept, since it measures the costs of not doing something else, whereas accounting measures the costs of what is actually being done. The opportunity cost of taking action A - say, building a shopping centre - is the sacrifice of the profits that would have been made by taking action B - building an office tower instead. Similarly, the income from renting out a paid-for building should at least equal the opportunity cost of selling the building and using the proceeds to make another investment.

Opportunity cost is an important concept in making investment choices and allocating resources. It does not make sense to use a factor of production - land, labour, capital, technology - for a particular purpose, if it yields less than the opportunity cost of using the factor in some other way. Similarly, it doesn't make sense for a worker to take a job in one industry, when he or she could make more money for the same skills and responsibilities in another industry; opportunity cost is therefore an important consideration in setting wages in different industries. Opportunity cost identifies choices that have to be made, since every factor of production can be said to have an alternative use.

OVERRIDING COMMISSION - In insurance a fee or percentage of money which is paid by the insurer to an agent or general agent for premium volume produced by other agents in a given geographic territory.

PARENT COMPANY - Companies frequently operate in groups whereby one company may own or control subsidiaries. The company which owns or controls the others is the "parent" company. The subsidiaries are affectionately often referred to as "pup" companies.

PERFECT COMPETITION - A market in which the laws of supply and demand work to bring about the most efficient allocation of resources and the lowest possible prices. Such an economy is supposed to work according to a number of ideal rules: 1. There are large numbers of both buyers and sellers, with no one a large enough buyer or seller to influence prices of supplies. 2. Products are homogeneous or identical, so that the buyer will always buy at the lowest price, thus forcing all suppliers to have the same low price. 3. Buyers and suppliers have perfect knowledge of prices and products throughout the economy. 4. Perfect freedom of entry and exit exists, so that new suppliers face no barriers if they want to enter the market, while old suppliers are free to leave. 5. It is assumed that there are no transportation or other such costs. 6. There are no profits other than the minimum return to the factors of production, to ensure that they remain in the market.

Perfect competition is a concept used by economists in constructing theoretical models of economic systems. It does not exist in the real world, although free-market economists see it as the ideal towards which public policy should aim.

PERIL - This term refers to the causes of possible loss in the property field, for instance, fire, windstorm, collision and hail. In the casualty field, the term "hazard" is more frequently used.

POLICY - The actual contract of insurance with all its details.

POLICY CONDITIONS - The conditions under which the insurance is written. Policy conditions are generally set out in the special part of the policy under some such heading as "policy conditions", or "special conditions" or "statutory conditions". They deal generally with the arrangement between the insured and the insurance company in such matters as how the insurer shall be notified of a claim, special limits of liability or trustee agreements, the rights to other insurance without notice, assignments, subrogation, etc.

Note the distinction between this and the "Insurance Agreements" which specially set out the insurance afforded by the policy. In certain forms of policies, particularly in the more common automobile and fire insurance fields, the law specifically sets out the wordings to be required as part of the policy. In

policies where these are applicable, the heading usually refers to "statutory conditions".

Where a policy has a typewritten endorsement which in effect affords greater coverage to the insured than it appears in the policy conditions, the court will interpret the policy as being in the broader terms since it assumes it more properly reflects the intentions of the party at the time the particular agreement was made.

Where an endorsement limits and affords less coverage than in the printed sections of the policy, there is a high degree of responsibility on the part of the insurance company to show that the limitation was known to the insured and accepted by him.

POLICY PERIOD - This is the period of time a policy is in effect (provides coverage). May be one year (annual) or three years (term). A covered loss must commence during the policy period.

POLICY YEAR - In annual policies, it is the policy period. In policies for longer periods, it is the current year between anniversary dates.

POLICYHOLDER - The party in whose name an insurance policy is issued.

POLITICAL RISKS - These risks include those changes made domestically or internationally by political bodies which affect the business community. For example: trade barriers, embargoes on raw materials, increased regulation, and judicial or legal decisions.

POOL - An organization of insurers or reinsurers through which particular types of risks are underwritten with premiums, losses and expenses shared in agreed ratios.

PORTFOLIO - 1) In transactions of reinsurance, it refers to all the risks of the reinsurance transaction. For example, if one company reinsures all of another's automobile business, let us say, the reinsuring company is said to assume the "portfolio" of automobile business and it is paid the total of the unearned premium on all the risks so reinsured (less some agreed commission). 2) Also refers to all the investments of a company.

PREDATORY PRICING - The practice of setting a relatively low price with the intent of damaging a competitor.

PREFERRED RISK - A risk of a class considered to be particularly desirable. (See also: DOG).

PREMIUM - The monetary consideration in contracts of insurance and reinsurance.

PREMIUM BASE - The ceding company's premiums (written or earned) to which the reinsurance premium rate is applied to produce the reinsurance premium.

PREMIUMS EARNED - When used as an accounting term, premiums earned describe the premiums written during a period plus the unearned premiums at the beginning of the period less the unearned premiums at the end of the period.

PRESENT VALUE - The value, in today's dollars, of a future inflow or outflow of funds in a proposed investment project. It is a tool used by corporations in assessing investment alternatives in which the future inflow and outflow of funds is discounted to reflect the time value of money.

PRIMARY BENEFITS - Primary benefits are paid regardless of other benefits to which the insured may be entitled. Benefits may be described as non-primary (secondary) if those benefits are paid only after other benefits to which the insured may be entitled have been taken into account. (See also: BENEFITS).

PRODUCT LIABILITY - The liability a merchant or a manufacturer may incur as the result of some defect in the product he has sold or manufactured.

PROOF OF LOSS - 1) A written statement of a claim giving the pertinent facts and data, usually in the form of an affidavit. 2) The written document signed by the insured, formally making a claim against the insurer.

PROPERTY INSURANCE - Provides financial protection against loss or damage to the insured's property caused by such perils as fire, windstorm, hail, explosion, aircraft, motor vehicles, vandalism, malicious mischief, riot and civil commotion, and smoke.

PRO RATA - In proportion.

PRO RATA CLAUSES - A provision in an insurance policy to pro rate the loss. It may be a provision to pro rate between the insured and the insurance company such as the co-insurance clause, the three-fourths loss clause, etc.

or it may be a provision to pro rate as between other insurance companies on the same risk.

As respect to the co-insurance clauses or proration with the insured, Driswold says "The pro rata principle, as applied to fire insurance, tends to equalize the proportion of the risk between the insurers and insured, by compelling the latter to bear a certain share of the loss in a ratio which the amount of insurance bears to the total value of the property at risk".

PUBLIC UTILITY - A corporation, often government-owned but sometimes privately owned, that provides an essential good or service to the public, usually under monopoly conditions. Examples include the provincial power companies, telephone companies, cable television, local transit services, and, in some instances, pipelines. Prices charged by public utilities are usually regulated. Provincial hydro companies, for example, may have to get approval for rate increases from provincial energy boards. Some utilities - for example, Bell Canada - are subject to a regulated utility rate of return, while others, such as cable operators, have to get government approval for rate increases.

PURE PREMIUM - 1) That part of the premium which is sufficient to pay losses and loss adjustment expenses but not including other expenses. 2) Also the premium developed by dividing losses by units of exposure disregarding any loading for commission, taxes and expenses.

RATE - A rate is the unit of charge made by the insurer against the property owner. It is based on the experience of the class of risk (incidence and frequency of loss), and is fixed at a level which will enable the insurance company to accumulate sufficient funds from all like risks to pay the losses for the fewer within the class who have losses, and at the same time provide sufficiently for the expenses of collecting and disbursing the fund.

RATE MAKING - The process of determining a rate. Basically it is done by special offices and a bureau which get all the statistics related to the particular peril and exposures, etc. and compute a rate.

RATED - A risk after having had a premium calculated for it is known to have been rated.

In life insurance, the company frequently charges a higher rate because of certain substandard medical

situations and such policies written at the higher rate are known as "rated" policies.

RATING BUREAU - A non-profit organization of insurance companies formed to promulgate rates for its members and subscribers.

REAL WAGES - The actual purchasing power of wages, as opposed to money wages. If wages are increased 5 per cent but inflation also increases 5 per cent, then real wages have not changed at all. If wages increased 5 per cent but inflation increased 7 per cent, then real wages, or purchasing power, have actually declined; similarly, a 5 per cent wage increase when inflation is 3 per cent means that real wages have increased.

RECIPROCAL INSURANCE EXCHANGE - A form of unincorporated consumer cooperative insurer. The members (subscribers) exchange insurance with each other. Each is an insured and an insurer. The exchange is managed by an "attorney-in-fact" who, for a fee, manages the exchange under the terms and conditions of a "subscriber's agreement" which all members sign. It is also called an Inter-Insurance Exchange.

RECOVERY - The amount of loss which an insurance company gets back from reinsurance, salvage or by subrogation against the person responsible for the loss.

RECOVERIES - Amounts received from a reinsurer for a reinsured's losses.

REINSURANCE - 1) A method used by an insurance company to transfer part or all of its liability for an insurance contract to another insurance company (a reinsurer). Reinsurance is used to allow an insurer to underwrite higher limits in a single contract without retaining the entire limit of liability. It is also used to improve an insurers own financial and surplus position while meeting the demand for its policies. 2) The process whereby a company may share its risk with another, paying to such sharing company a portion of the premium it receives. Loss payments are made, by the company accepting the reinsurance, direct to the producing company, not the policyholder.

REINSURER - An organization which assumes the liability of another by way of reinsurance.

REPLACEMENT COST INSURANCE - Insurance which pays the

full value of damaged or destroyed property without taking depreciation into consideration.

RESIDUAL MARKET - A term used to describe the market to which individuals seeking automobile insurance must turn once they are denied coverage in the regular market. [See also: (a) ASSIGNED RISK PLAN; (b) FACILITY PLAN].

RETROSPECTIVE RATING - A rating procedure that determines the final rate at the expiration of the policy. It is used very commonly in areas where the information required to ascertain a premium is not available at the beginning of the policy. E.g. a manufacturer may require products liability insurance but he does not know at the beginning of the year just how many different products he will make and how many items of each. Consequently he does not know the amount of his payroll. He will probably be asked to make an advance premium representing a rough approximation and when the final payroll is available at the end of the year, an adjustment is made by either paying the additional premium that was used or getting a refund on the unused part of the premium.

It is also used in some automobile situations particularly in hazardous risks when the premium will depend upon the particular experience during the course of the year with the insurance company taking the responsibility for anything below or above the minimum and maximum premium.

RESERVE - See: CLAIM RESERVE and UNEARNED PREMIUM RESERVE.

RISK - 1) Defined variously as uncertainty of loss, chance of loss, or the variance of actual from expected results. However defined, its existence is the reason people buy insurance. 2) The subject matter of an insurance contract, e.g., the building, cargo, or liability exposure insured. (Lenz)

SAFE DRIVER RATING PLAN - A merit rating program for private passenger cars whereby insureds with clean driving records qualify for lower automobile insurance premiums, and insureds who have an accident or conviction history pay higher premiums. The amount of premium is regulated by a point system, which assigns a certain number of points for accidents and traffic violations in which the insured is involved during a stated period--usually three years. (See also: MERIT RATING).

SEASONAL UNEMPLOYMENT - Unemployment caused by climatic and other conditions each year. Such unemployment is predictable in certain industries, such as tourism, forestry, fishing and Great Lakes shipping; and less predictable than it used to be in others, such as construction. There is also seasonal employment - in the retail industry at Christmas, for example.

SELF-INSURER - An individual, partnership or corporation who retains all or part of the risk for its own account and purchases an excess of loss cover to protect itself in the event of a catastrophe.

SOCIAL COSTS - The cost of private actions, such as the production of goods or services, that are paid for by the public. Examples include the pollution of the environment and the health-care costs of injured or ill workers.

SOCIAL INFLATION - The increasing of insurance losses caused by higher jury awards, more liberal treatment of claims by legislated rises in benefit levels and new concepts of tort and negligence, among others.

STANDARD FORM - A form, be it a policy or some other document used to write insurance, which has been adopted and is used by a large number of companies, or has been promulgated by a rating bureau. The use of standard forms does away with much of the need to scrutinize every word of a policy form, since the standard has been examined and tried by many before.

STANDARD POLICY - A policy generally in use and in some lines of insurance a policy prescribed by law.

STANDARD PROVISIONS - The essential parts of an insurance contract which are the same as are commonly used in the industry.

STATUTORY ACCOUNTING PRINCIPLES (SAP) - Those principles required by law which must be followed by insurance companies in submitting their financial statements to provincial insurance departments. Such principles differ from generally accepted accounting principles (GAAP) in some important respects, e.g., SAP requires that expenses must be recorded immediately and cannot be deferred to track with premiums as they are earned and taken into revenue. (Hill)

STATUTORY PROVISION - A provision that is required by law

to be included in an insurance contract. (See also: STANDARD PROVISIONS).

SUBROGATION - When a company pays a loss for which some person other than the policyholder is responsible, the company's right to recover its loss from the guilty party is the right of subrogation.

SURETY - The underwriter who guarantees something under a bond.

TERM - The period of time from the inception to the termination of an insurance contract.

THIRD PARTY - The claimant under liability insurance. So called because he is not one of the two parties -- insured and insurer -- who enters into the insurance contract which pays the claim.

THIRD PARTY INSURANCE - A type of insurance in which the insured is indemnified with respect to any loss which he might suffer as a result of his legal liability to others arising out of the peril against which the particular insurance is written.

THRESHOLD (in no-fault automobile coverage) - No-fault automobile insurance plans are designed to exempt the insured from tort liability actions brought about by automobile accidents. Yet, under most plans, the injured party can sue once the expenses exceed a certain level or if certain types of injuries occurred. This level is referred to as the threshold and differs among various state plans. However, under the personal auto policy coverage is provided automatically if the driver enters a no-fault state. [See: (a) NO-FAULT (AUTOMOBILE); (b) MODIFIED NO FAULT].

TIME VALUE OF MONEY - A concept used in investment analysis, according to which a specific amount of money in the hand at present is worth more than the same amount of money in the future, because money available now can be invested and earn a return. Thus \$100 invested today at 10 per cent would be worth \$110 a year from now, and hence would be worth more than \$100 received a year from now.

TORT - A tort is an intentional or unintentional wrong (other than breach of contract) for which a civil action can be brought. It involves the violation of another's natural right, and is considered by law to be a civil injury. Proof of such breach of a legal duty owed the

injured party by the at-fault party can result in money damages being awarded.

TORT FEASOR - The party that commits a tort.

TORT LIABILITY REFORM - Over the years there has been considerable concern over the effectiveness of the tort liability system. Many changes have been proposed including no-fault plans. The tort liability reform concept focuses upon amending the system to eliminate the problems. It suggests statutes be reviewed, arbitration for small claims, procedural reforms to improve trials, review of laws relating to negligence and intent, reasonable cost for legal counsel, and reformation of the court system. This type of widespread reform would apply to all tort liability activities not just automobile and is intended to improve the system.

TRUE NO-FAULT AUTOMOBILE INSURANCE PLAN - This plan is designed to totally eliminate tort liability from automobile claims. [See also: (a) NO FAULT AUTOMOBILE; (b) MODIFIED NO-FAULT].

UNDERWRITER - The insurance company or group that underwrites or insures a particular risk. It is also used to identify the individual in the company who accepts or rejects business in the particular line he specializes in, and in this way, chooses risks his principals are prepared to consider.

UNDERWRITING - The process of determining the acceptability of a risk on its own merits. In contrast to the assignment of a risk to a class based on general criteria, the underwriting process involves an evaluation of the individual and possibly unique characteristics of each risk.

UNEARNED PREMIUM - That part of the premium which has not been used or earned, and which must be returned to the insured in the event of cancellation of policy by the company prior to its full term.

UNEARNED PREMIUM RESERVE - Insurance premiums are paid in advance. A company, however, "earns" the premium only as fast as time elapses. Yesterday's premium is earned. Tomorrow's premium is unearned. The unearned premium reserve is the sum of all the unearned premiums of all the unexpired policies that a company has on its books.

UNIFORM PROVISIONS - The specific wording in certain types of insurance is set out by law and insurance

companies are required to write that type of insurance on that particular form. This is known as a "uniform provision". [See also: (a) STANDARD PROVISIONS; (b) STATUTORY PROVISIONS].

UNINSURED AUTOMOBILE - An automobile which is not covered by any insurance agreement.

UNINSURED MOTORIST - This means the driver of an automobile for which there is no current automobile liability insurance. Under uninsured motorists' coverage an uninsured motorist also includes a hit-and-run motorist as well as one that has insurance but whose insurer is insolvent.

UNINSURED MOTORISTS' INSURANCE - This coverage was designed to provide payment to the insured, family members, and their passengers for injuries caused by negligent uninsured motorists as defined in the coverage.

UNSATISFIED JUDGMENT FUND - A fund created to reimburse persons injured in automobile accidents who cannot collect damages awarded to them because the responsible party is either insolvent or uninsured. Such funds are often financed by an addition to the regular automobile registration fee, and will only pay unsatisfied judgments up to fixed limits.

VARIABLE COST - A cost that goes up or down, depending on whether production goes up or down. Examples include the costs of raw materials, parts, and labour directly involved in the production process. Such costs are also known as operating costs, as opposed to fixed costs or overhead. (See also: **FIXED COST**).

VOID OR VOIDABLE - A contract is void when it is destitute of all legal effect. A voidable contract is one which can be made void at the option of one of the parties.

WAIVER - An intentional relinquishing of a known right. A waiver under a policy is required to be clearly expressed and in writing.

NOTE: Definitions from the following publications have been used with permission:

- (1) Insurance Words and their Meanings: A Glossary of Property and Casualty Insurance Terms/by Gerald R. Heath and twelve other authorities. - 12th edition/edited by Robert W. Strain. - Indianapolis: Rough Notes, c1978 repr. 1979.
- (2) Glossary of Insurance Terms and Legal Terms Used in Insurance Claims/by W. A. Jennings. - Toronto: Insurance Institute of Canada, c1969 repr. 1982.

APPENDIX IX

COMMENT ON THE ECONOMIC COST OF ACCIDENTS by Saskia Oltheten Matheson

In 1982, the United States Department of Transportation estimated the economic cost of traffic injuries for each abbreviated injury scale (A.I.S.)¹ level established.² The A.I.S. figures are presented in Table 1 below:

TABLE 1
GROSS UNITED STATES SOCIETAL COST RESULTING
FROM AUTOMOBILE ACCIDENT INJURIES IN 1984
ABBREVIATED INJURY SCALE LEVEL

FACTOR	1	2	3	4	5	FATAL
Costs	\$ 209	\$1,735	\$ 3,973	\$12,093	\$122,249	\$ 1,72
Productivity						
Losses	123	699	1,974	16,293	86,978	298,45
Legal Court						
Costs	670	735	3,362	6.485	9,909	16,87
Coroner						21
Emergency						
Costs	77	144	160	253	318	36
Insurance						
Expenses	673	673	673	15,779	15,779	15,77
Government						
Aid Costs	93	94	115	584	595	89
AVERAGE TOTAL COST/VICTIM	\$1,845	\$4,080	\$10,257	\$51,487	\$235,828	\$334,30
TOTAL COST** ALL VICTIMS (\$millions)	\$4,212	\$1,337	\$ 1,195	\$ 697	\$ 1,336	\$ 14,69

**This figure is calculated by multiplying the average total cost per victim by the number of victims in each Abbreviated Injury Scale level.

¹As expected, the higher the number the more severe the injury; e.g., 1 is minimal and 5 is life-threatening.

²U.S. Department of Transportation, The Economic Cost to Society of Motor Vehicle Accidents (Washington: D.O.T., 1982). Figures were adjusted for inflation in order to show costs in 1984 dollars; U.S. Department of Transportation, Compensating Auto Accident Victims: A Follow-up Report on No-Fault Auto Insurance Experiences (Washington: D.O.T., 1985).

As can be seen from Table 1, the 1984 data suggest that the total economic cost of traffic accidents in the United States was approximately \$23.5 billion.³

Assuming that the Canadian experience is similar to the American experience, and given the fact that Ontario's population is approximately 1/25 of that of the United States, the societal cost of traffic accidents in Ontario is approximately \$1-billion each year (based on American dollars).

In 1982, Richard Slocum of the Policy Planning and Research Division, Ontario Ministry of Transportation and Communications, attempted to estimate the cost of motor vehicle accidents in Ontario.⁴ There are some problems with the model used. It assumes that there is no measurable loss in productivity resulting from fatalities. The model treats all injured females injured as homemakers. It expressly understates legal costs, court fees and health care costs. Nevertheless, with some adjustments, the model is helpful in approximating the economic value of the resources lost in motor vehicle accidents.

Slocum breaks down costs into seven compartments:

(a) property costs;

³ Figure obtained by adding the numbers in bottom line of the Table. The exact figure is \$23,468,000,000.

⁴ Richard Slocum, Ontario Motor Vehicle Accidents: An Economic Appraisal. (Toronto: Ontario Ministry of Transportation and Communications, Policy Planning and Research Division, 1982).

- (b) health care costs;
- (c) productivity losses;
- (d) funeral losses;
- (e) insurance operating costs;
- (f) legal and court fees; and
- (g) investigation costs.

Property cost is the value of physical damage to vehicles and to the environment (roads, buildings, etc.). In 1985, the average property damage accident cost was almost \$3,000 per accident.⁵ Health care costs include those costs which are paid by O.H.I.P. and privately. The only available figures are contained in a survey conducted by the Ministry of Health involving 525 victims of motor vehicle accidents injured in 1975 and 1976 and admitted to hospital.⁶ Because accident victims do not always go to

⁵Slocum uses the M.T.C. figures from 1980 Ontario Motor Vehicle Accidents Facts (Toronto: M.T.C., 1981) for property damage (\$357,640,284). He divides that figure by the total number of reportable accidents (196,501). The figure is compiled from estimates made by police at the scene of the accident and entered on the accident report. These estimates are not foolproof. Further, the figure does not include accidents with property damage of less than \$400, since that was the minimum reporting limit at the time. For the adjusted 1985 figure, the property damage estimate (\$547,518,951) and the number of reportable accidents (189,750) are taken from Ontario Road Safety Annual Report, 1985. The same limitations apply to this figure as apply to Slocum's figures with the exception that the minimum reporting level was increased to \$700 in 1985.

⁶Ontario Ministry of Transportation and Communications, Policy Planning and Research Division, Injury: An Ontario Survey of the Societal and Personal Costs of Hospitalized Motor Vehicle Accident Victims (Toronto: The Policy Planning and Research Division, Ontario Ministry of Transportation and Communications and Ontario Ministry of Health, 1981), for the Interministerial Task Force on Motor Vehicle Injuries (Toronto: The Task Force, 1981).

hospital, even if they are injured, the figures tend to understate real costs. Slocum's model, therefore, only applies the average health care cost to hospitalized victims (55% of all those injured). The adjusted 1985 figure for average health care costs per injured victim is \$853.⁷

Productivity loss presents the greatest difficulty in the Slocum model. The Ministry of Health's survey shows that the average number of work days lost for hospitalized motor vehicle accident victims is 15.7, while the number of housework days lost is 14.4. To estimate lost production, Slocum divides 15.7 by a five-day work week and multiplies that figure by the average weekly wage. This yields the loss per injured male victim. To obtain a loss figure for injured females, Slocum divides the 14.4 days of housework loss by the five-day working week and multiplies the result by the average weekly wage or females in Ontario.⁸ Slocum then multiplies the two resulting productivity loss figures by the proportion of injured who are male (59%) and female (41%). This yields an overall average productivity loss.

(Study Director: Richard Slocum).

⁷The cost, calculated from Injury was \$361 for 1975. Slocum updated the figure to \$596 for 1980. When adjusted to 1985 dollars the figure for health care costs is \$853. (Inflation increased prices by 43% between 1980 and 1985, according to the Statistics Canada Consumer Price Index).

⁸The average weekly wage for females is used to estimate the opportunity cost of housework. The implied wages from housework must be enough to keep homemakers from going into the labour force. If housework were worth less, women would go into the labour force and pay someone else to do the tasks; if it were worth more, women would leave the labour force and drive up the average wage.

Several problems arise. The Slocum model assumes all injured and hospitalized women were homemakers. The fact that women made up 40% of the labour force in 1980 is not taken into account in calculating the average weekly wage and applying it. In addition, some might argue that housework days lost should not be calculated on the basis of a five-day week, but rather on the basis of a seven-day housework week. Adjusting the Slocum figures to remedy the problems referred to, and updating them to 1985, results in an overall production loss of \$1,357 per victim.⁹ Updating Slocum's figures to 1985 results in an

⁹From Injury we know that hospitalized victims report an average of 15.7 work days lost and 14.4 housework days lost. The average weekly wage for Ontario was \$309 in 1980 and the average weekly wage for females was \$202. Slocum multiplied weekly salary by days lost and divided through by 5 working days:

$15.7 \times \$309 + 5 = \970 per injured male victim; and
 $14.4 \times \$202 + 5 = \582 per injured female victim.

Multiplying these figures by the proportion of victims of either sex produces the following result:

$(\$970 \times .59) + (\$582 \times .41) = \$811$ per injured victim.

The labour participation ratio for women aged 15 and over in Ontario in 1985 was 57.9%. Of the 41% of accident victims who were female, 23.7% ($57.9\% \times 41\%$) should be included in the work force.

It is assumed that women not in the labour force are homemakers. It is also assumed that men not in the labour force would have indicated "0" work days lost, rather than a certain number of housework days lost and, thus, are implicitly included in the averages. This may overstate the number of female homemakers and understate the number of male homemakers. It is assumed that these figures will balance each other out. The average weekly wage in Ontario is \$455.33, which includes both male and female workers. The figure is used for both workers and homemakers. The new equations are as follows:

$15.7 \times \$455.32 + 5 = \$1,430$ per injured worker.

$14.4 \times \$455.32 + 7 = \$ 936$ per injured homemaker.

Workers = 59% (males) + 26.2% (female workers) = 85.2%

Homemakers = 14.8%

average wage loss of \$1,160 or \$197 lower than the adjusted figure.¹⁰

The Slocum model does not take into account production losses arising from fatalities. The U.S. Department of Transportation study estimated the per fatality loss at almost \$300,000 in 1984.¹¹ This is the best estimate available. Adjusting the U.S. Department of Transportation's figures to 1985 dollars yields an estimated \$310,408 per fatality productivity loss figure.¹²

To calculate funeral costs, Slocum compares the expenditure from the Inquiry survey with a present value calculation of funeral costs at the expected time of

Average loss per victim = $(\$1,430 \times .852) + (936 \times .148)$
= \$1,357.

¹⁰The overall difference in production loss would be \$11,828,461 less than the adjusted figure.

¹¹U.S. Department of Transportation, Compensating Auto Accident Victims, 1985.

¹²The U.S. figures are expressed in U.S. dollars. (This figure is used to account for the possibility of a higher American average wage).

natural death.¹³ The adjusted 1985 figure is \$2,131.46 per fatality.

Slocum does not regard compensation payments made by insurers to victims as losses. In the Slocum model, those payments have already been calculated as health care costs, productivity costs and so on. Compensation paid by an insurer is viewed as a transfer of money back to the victim from amounts previously transferred in the form of premiums paid by all potential victims to insurers).

Resources are also used in this insurance transfer system. In 1985 figures, the earned premiums for all private passenger automobile coverages in Ontario (excluding farmers) amounted to \$1,669,471,034.¹⁴ Operating costs vary; however, a reasonable average over the past five years is 33.3%.¹⁵ When that factor is applied to earned premiums, the result is a private

¹³Although everyone eventually pays funeral costs, the estimated average time until natural death occurred for the sample group was 35-40 years. Assuming a real interest rate (interest rate less inflation) of 6%, the amount needed in 1980 to produce \$1,650 in 40 years is \$160.00. The amount was so minor that Slocum ignored the offset. Updating Slocum's figure to 1985 dollars results in funeral costs of \$2,361 per fatality. The 1985 offset, i.e. the money required now to provide funeral expenses in 40 years, is \$229.54. Thus, the extra money spent is \$2,131.46.

¹⁴Insurance Bureau of Canada, Automobile Insurance Experience ("Green Book"), 1985.

¹⁵From the "Green Book", we know that operating expenses outside of claims adjustment expenses were 23.3% for 1985. The estimated claims adjustment cost is 11% of premiums (see Chapter 16 on Transaction Costs). The total figure for 1985 equals 24.3%. Premium taxes were not included since they represent a transfer, not a resource expenditure.

passenger automobile total operating cost of
\$555,933,854.¹⁶

Slocum's estimate of legal and court fees, updated to 1985, results in a cost of \$250 per injured victim. His calculations do not take into account property damage accidents or fatalities. The figure is thus a lowest cost estimate.

Slocum included in his calculations the cost of police investigations of accidents (mostly a time cost). In 1985 terms, Slocum's conclusions were that police investigations represent a cost of \$34 for a property damage accident, \$50 for an injury-producing accident and \$319 for a fatality.¹⁷

The economic cost of motor vehicle accidents in Ontario can only be approximated. Slocum provides the

¹⁶Operating costs will, of course, increase when premiums paid by farmers (\$17,178,192), commercial vehicles (\$147,313,616), motorcycles (\$27,011,879) and snowmobiles (\$8,496,475) are considered.

¹⁷Slocum uses a \$12 per hour wage rate to cost the time spent on an investigation. The figures for hours spent come from O.P.P. data. For 1980, the costs are:

Property damage accident	(2.0 hours x \$12)	\$ 24
Injury accident	(2.9 hours x \$12)	\$ 35
Fatal accident	(18.6 hours x \$12)	\$223

Using the 43% adjustment for inflation, investigation costs per accident in 1985 dollars are \$34 (P.D.), \$50 (Injury) and \$319 (Fatal). According to the Ontario Road Safety Annual Report, there were 114,874 property damage accidents, 73,840 injury accidents and 1,036 fatal accidents reported in 1985. Multiplied by the per accident investigation costs, this led to total costs of:
(114,874 x \$34) + (73,840 x \$50) + (1,036 x \$319) =
\$7,928,200.

best available data. Updating Slocum's figures and correcting the model in areas previously discussed produced an economic cost breakdown summarized in Table 2 below:

TABLE 2

ECONOMIC COST OF MOTOR VEHICLE
ACCIDENTS IN ONTARIO -- 1985

Property damage		\$547,518,951
Health care	(109,169 x 55% x \$853)	51,216,636
Production	(109,169 x 55% x \$1,357)	81,478,283
Loss	(1,191 x \$310,408)	369,695,928
Funeral costs	(1,191 x \$ 2,131.46)	2,538,569
Insurance operating costs		622,533,908
Legal & court fees	(109,169 x .55 x \$250)	15,010,738
court fees		
Accident	(114,874 x \$ 34)	3,905,716
investigation	(73,840 x \$ 50)	3,692,000
	(1,036 x \$319)	330,484
TOTAL COST:		<u>\$1,697,921,213</u>

APPENDIX X

ONTARIO STANDARD AUTOMOBILE POLICY

S.P.F. No. 1

(Owner's Form)

PLEASE READ THIS CAREFULLY

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INSURING AGREEMENTS

Now Therefore in consideration of the payment of the premium specified and of the statements contained in the application and subject to the limits, terms, conditions, provisions, definitions and exclusions herein stated and subject always to the condition that the insurer shall be liable only under the section(s) or subsection(s) of the following Insuring Agreements A, B, C for which a premium is specified in item 4 of the application and no other

SECTION A — THIRD PARTY LIABILITY

The insurer agrees to indemnify the insured and, in the same manner and to the same extent as if named herein as the insured, every other person who with his consent personally drives the automobile, or personally operates any part thereof, against the liability imposed by law upon the insured or upon any such other person for loss or damage arising from the ownership, use or operation of the automobile and resulting from

BODILY INJURY TO OR DEATH OF ANY PERSON OR DAMAGE TO PROPERTY

The Insurer shall not be liable under this section,

(a) — deleted

(b) — deleted

(c) — deleted

(d) for loss of or damage to property carried in or upon the automobile or to any property owned or rented by, or in the care, custody or control of any person insured by this section; or

(e) — deleted

(f) — deleted

(g) for any amount in excess of the limit(s) stated in section A of item 4 of the application, and expenditures provided for in the Additional Agreements of this section; subject always to the provisions of the section of the Insurance Act (Automobile Insurance Part) relating to the nuclear energy hazard; or

(h) for any liability arising from contamination of property carried in the automobile.

See also General Provisions, Definitions, Exclusions and Statutory Conditions of this Policy

ADDITIONAL AGREEMENTS OF INSURER

Where indemnity is provided by this section the insurer shall,

(1) upon receipt of notice of loss or damage caused to persons, or property, serve any person insured by this policy by such investigation thereof, or by such negotiations with the claimant, or by such settlement of any resulting claims, as may be deemed expedient by the insurer; and

(2) defend in the name and on behalf of any person insured by this policy and at the cost of the insurer any civil action which may at any time be brought against such person on account of such loss or damage to persons or property; and

(3) pay all costs taxed against any person insured by this policy in any civil action defended by the insurer and any interest accruing after entry of judgment upon that part of the judgment which is within the limit(s) of the insurer's liability; and

(4) in case the injury be to a person, reimburse any person insured by this policy for outlay for such medical aid as may be immediately necessary at the time of such injury; and

(5) be liable up to the minimum limit(s) prescribed for that province or territory of Canada in which the accident occurred, if that limit(s) is higher than the limit(s) stated in section A of item 4 of the application; and

(6) not set up any defense to a claim that might not be set up if the policy were a motor vehicle liability policy issued in the province or territory of Canada in which the accident occurred.

AGREEMENTS OF INSURED

Where indemnity is provided by this section, every person insured by this policy

(a) by the acceptance of this policy, constitutes and appoints the insurer his irrevocable attorney to appear and defend in any province or territory of Canada in which action is brought against the insured arising out of the ownership, use or operation of the automobile;

- (b) shall reimburse the Insurer, upon demand, in the amount which the Insurer has paid by reason of the provisions of any statute relating to automobile insurance and which the Insurer would not otherwise be liable to pay under this policy.

SECTION B — ACCIDENT BENEFITS

The Insurer agrees to pay to or with respect to each insured person as defined in this section who sustains bodily injury or death by an accident arising out of the use or operation of an automobile:

SUBSECTION I — MEDICAL, REHABILITATION AND FUNERAL EXPENSES

- (1) All reasonable expenses incurred within four years from the date of the accident as a result of such injury for necessary medical, surgical, dental, chiropractic, hospital, professional nursing and ambulance service and for any other service within the meaning of insured services under The Health Insurance Act and for such other services and supplies which are, in the opinion of the physician of the insured person's choice and that of the insurer's medical advisor, essential for the treatment, occupational retraining or rehabilitation of said person, to the limit of \$25,000 per person.
- (2) Funeral expenses incurred up to the amount of \$1,000 in respect of the death of any one person.

The Insurer shall not be liable under this subsection for those portions of such expenses payable or recoverable under any medical, surgical, dental, or hospitalization plan or law or, except for similar insurance provided under another automobile insurance contract, under any other insurance contract or certificate issued to or for the benefit of, any insured person.

SUBSECTION 2 — DEATH BENEFITS AND LOSS OF INCOME PAYMENTS

Part I — Death Benefits

A. Subject to the provisions of this Part, for death that ensues within 180 days of the accident or within 104 weeks of the accident if there has been continuous disability during that period, a payment — based on the status at the date of the accident of the deceased in a household where a spouse or dependants survive — of the following amounts:

Head of the Household	\$10,000
Spouse of the Head of the Household	10,000
Dependant within the meaning of sub-subparagraph (b) of subparagraph 3 of paragraph B	2,000

In addition, with respect to death of the head of the household, where there are two or more survivors — spouse or dependants — the principal sum payable is increased \$1,000 for each survivor other than the first.

B. For the purposes of this Part,

- (1) "Spouse of the head of the household" means the spouse with the lesser income from employment in the twelve months preceding the date of the accident.
- (2) "Spouse" means either of a man and woman who,
- are married to each other;
 - are married to each other by a marriage that is voidable and has not been voided by a judgment of nullity; or
 - have gone through a form of marriage with each other, in good faith, that is void and are cohabiting or have cohabited within the preceding year,
- and includes,
- (d) either of a man and woman not being married to each other who have cohabited,
- continuously for a period of not less than five years, or
 - in a relationship of some permanence where there is a child born of whom they are the natural parents, and have so cohabited within the preceding year.
- (3) "Dependant" means,
- the spouse of the head of the household who resides with the head of the household;
 - a person,
 - under the age of 18 years who resides with and is principally dependent upon the head of the household or the spouse of the head of the household for financial support,
 - 18 years of age or over who, because of mental or physical infirmity, is principally dependent upon the head of the household or the spouse of the head of the household for financial support, or
 - 18 years of age or over who, because of full-time attendance at a school, college or university is principally dependent upon the head of the household or the spouse of the head of the household for financial support, or

- a parent or relative,
 - of the head of the household, or
 - of the spouse of the head of the household, residing in the same dwelling premises and principally dependent upon the head of the household or the spouse of the head of the household for financial support.
- (4) The total amount payable shall be paid to a person who is the head of the household or the spouse of the head of the household, as the case may be, if that person survives the deceased by at least 30 days.
- (5) The total amount payable with respect to death where no head of the household or spouse survives the deceased by at least 30 days shall be divided equally among the surviving dependants.
- (6) No amount is payable on death, other than incurred funeral expenses, if no head of the household or dependant survives the deceased by at least 30 days.

Part II — Loss of Income

Subject to the provisions of this Part, a weekly payment for the loss of income from employment for the period during which the insured person suffers substantial inability to perform the essential duties of his occupation or employment, provided,

- such person was employed at the date of the accident;
- within 30 days from the date of the accident the insured person suffers substantial inability to perform the essential duties of his occupation or employment;
- no payments shall be made for any period in excess of 104 weeks except that if, at the end of the 104 week period, it has been established that such injury continuously prevents such person from engaging in any occupation or employment for which he is reasonably suited by education, training or experience, the Insurer agrees to make such weekly payments for the duration of such inability to perform the essential duties.

Amount of Weekly Payment — The amount of a weekly payment shall be the lesser of,

- \$140 per week; or
 - 80 percent of the insured person's gross weekly income from employment, less any payments for loss of income from employment received by or available to such person under,
 - the laws of any jurisdiction,
 - wage or salary continuation plans available to the person by reason of his employment, and
 - Part III of this Subsection 2,
- but no deduction shall be made for any increase in such payment due to a cost of living adjustment subsequent to the insured person's substantial inability to perform the essential duties of his occupation or employment or for the first two weeks of such substantial inability.

For the purposes of this Part,

- there shall be deducted from an insured person's gross weekly income any payments received by or available to him from part-time or other employment or occupation subsequent to the date of the accident;
- a principal unpaid housekeeper residing in the household not otherwise engaged in occupation or employment for wages or profit, if injured, shall be deemed disabled only if completely incapacitated and unable to perform any of his or her household duties and, while so incapacitated, shall receive a benefit at the rate of \$70 per week for not more than 12 weeks;
- a person shall be deemed to be employed,
 - if actively engaged in an occupation or employment for wages or profit at the date of the accident; or
 - if 18 years of age or over and under the age of 65 years, so engaged for any six months out of the preceding 12 months;
- a person receiving a weekly payment who, within 30 days of resuming his occupation or employment is unable to continue such occupation or employment as a result of such injury, is not precluded from receiving further weekly payments;
- except for the first two weeks of disability, where the payments for loss of income payable hereunder, together with payments for loss of income under another contract of insurance other than a contract of insurance relating to any wage or salary continuation plan available to an insured person by reason of his employment, exceed the actual loss of income of the insured person, the Insurer is liable only for that proportion of the payments for loss of income stated in this policy that the actual loss of income of the person insured bears to the aggregate of the payments for loss of income payable under all such contracts.

Part III — Supplemental Benefits Respecting Accidents Occurring in Quebec

A. For the purposes of this Part,

- (a) "accident" means an event occurring in Quebec resulting in damage caused by an automobile, or by the use of an automobile, or by the load of an automobile, including damage caused by a trailer;
- (b) "bodily injury" means physical, psychological or mental injury including death as well as damage to the clothing worn by the victim at the time of the accident;
- (c) "resident of Ontario" means any person,
 - (i) who is authorized by law to be or to remain in Canada and is living and ordinarily present in Ontario, and
 - (ii) who meets the criteria prescribed in Division II of O.C. 374-78 made under the Automobile Insurance Act (Quebec), which apply with necessary modifications, but does not include a person,
 - (iii) who is merely touring, passing through or visiting Ontario, or
 - (iv) who is, at the time of an accident in Quebec, the owner or driver of, or a passenger in, an automobile registered in Quebec;
- (d) "person insured in Quebec" means a resident of Ontario who is,
 - (i) any person while an occupant of the described automobile or of a newly acquired or temporary substitute automobile as defined in this policy,
 - (ii) the insured and, if residing in the same dwelling premises as the insured, his or her spouse and any dependent relative of either while an occupant of any other automobile,
 - (iii) any person, not the occupant of an automobile, who is struck by the described automobile or a newly acquired or temporary substitute automobile as defined in this policy,
 - (iv) the named insured, if an individual, and his or her spouse and any dependent relative residing in the same dwelling premises as the named insured, not the occupant of an automobile who is struck by any other automobile,
 - (v) if the insured is a corporation, unincorporated association, or partnership, any employee or partner of the insured for whose regular use the described automobile is furnished, and his or her spouse and any dependent relative of either, residing in the same dwelling premises as such employee or partner, while an occupant of any other automobile,
 - (vi) any employee or partner of the insured, for whose regular use the described automobile is furnished, and his or her spouse and any dependent relative of either, residing in the same dwelling premises as such employee or partner, while not the occupant of an automobile who is struck by any other automobile, and
 - (vii) any other person who is,
 - a. the occupant of an automobile, or
 - b. not being the occupant of an automobile, is struck by an automobile,
 driven by a person insured in Quebec as defined in sub-paragraphs i to vi of this subparagraph.

B. With respect to bodily injury, as a result of an accident, to a person insured in Quebec the Insurer agrees to make payments under this Part in the same amount and form and subject to the same conditions as if such person were a resident of Quebec as defined in the Automobile Insurance Act (Quebec) and the regulations made under that Act and entitled to payments under that Act and those regulations.

SUBSECTION 3 — UNINSURED MOTORIST COVER

All sums that

- (a) a person insured under the contract is legally entitled to recover from the owner or driver of an uninsured automobile or unidentified automobile as damages for bodily injuries resulting from an accident involving an automobile;
- (b) any person is legally entitled to recover from the owner or driver of an uninsured automobile or unidentified automobile as damages for bodily injury to or the death of a person insured under the contract resulting from an accident involving an automobile; and
- (c) a person insured under the contract is legally entitled to recover from the identified owner or driver of an uninsured automobile as damages for accidental damage to the insured automobile or its contents, or to both the insured automobile and its contents, resulting from an accident involving an automobile.

1. Definitions:

For the purposes of this subsection,

- (a) "insured automobile" means the automobile as defined or described under the contract;

- (b) "person insured under the contract" means,
 - (i) in respect of a claim for damage to the insured automobile, the owner of the automobile,
 - (ii) in respect of a claim for damage to the contents of the insured automobile, the owner of the contents,
 - (iii) in respect of a claim for bodily injuries or death,
 - a. any person while an occupant of the insured automobile,
 - b. the insured and, if residing in the same dwelling premises as the insured, his or her spouse and any dependent relative of either,
 - (1) while an occupant of an uninsured automobile, or
 - (2) while not the occupant of an automobile or of railway rolling stock that runs on rails, who is struck by an uninsured or unidentified automobile,
 - c. if the insured is a corporation, unincorporated association or partnership, any director, officer, employee or partner of the insured for whose regular use the insured automobile is furnished, and, if residing in the same dwelling premises as such person, his or her spouse and any dependent relative of the person or the spouse,
 - (1) while an occupant of an uninsured automobile, or
 - (2) while not the occupant of an automobile or of railway rolling stock that runs on rails, who is struck by an uninsured or unidentified automobile, where such director, officer, employee or partner or his or her spouse is not the owner of an automobile insured under a contract;
- (c) "unidentified automobile" means an automobile with respect to which the identity of either the owner or driver cannot be ascertained;
- (d) "uninsured automobile" means an automobile with respect to which neither the owner nor driver thereof has applicable and collectible bodily injury liability and property damage liability insurance for its ownership, use or operation, but does not include an automobile owned by or registered in the name of the insured or his or her spouse.

2. Qualification of Dependent Relative

Where a dependent relative referred to in subparagraph (iii) of paragraph (b) of Clause 1,

- (a) is the owner of an automobile insured under a contract; or
 - (b) sustains bodily injuries or dies as the result of accident while the occupant of his own uninsured automobile,
- such relative shall be deemed not to be a dependent relative for the purposes of this subsection 3.

The following terms, conditions, provisions, exclusions and limits prescribed by the Regulations made under Section 231(4) of The Insurance Act apply to the coverage under this Subsection of this Section B.

3. Limits and Exclusions

- (1) The Insurer shall not be liable to make any payment,
 - (a) for any amount in excess of the minimum limits for automobile liability insurance in the jurisdiction in which the accident occurs regardless of the number of persons injured or killed or the damage to the automobile and contents, and in no event shall the Insurer be liable for any amount in excess of the minimum limits set out in section 219 of The Insurance Act;
 - (b) where a person insured under the contract is entitled to recover money under any valid policy of insurance other than money payable on death, except for the difference between such entitlement and the relevant minimum limits determined under paragraph (a);
 - (c) where the person insured under the contract is entitled to recover money under the third party liability section of a motor vehicle liability policy;
 - (d) to any person involved in an accident in a jurisdiction in which a valid claim may be made for such payment against an unsatisfied judgment or similar fund;
 - (e) for any loss or damage caused directly or indirectly by radioactive material; or
 - (f) in respect of damages for accidental damage to the insured automobile and its contents, for the first \$100 of any loss in any one occurrence nor any amount in excess of \$25,000.
- (2) Where by reason of any one accident, liability results from bodily injury or death and from damage to the insured automobile or its contents,
 - (a) claims arising out of bodily injury or death have priority to the extent of 95 per cent of the amount payable over claims arising out of damage to the insured automobile and its contents; and
 - (b) claims arising out of damage to the insured automobile and its contents have priority to the extent of 5 per cent over claims arising out of bodily injury or death.

4. Accidents Involving Unidentified Automobiles

Where an unidentified automobile has caused bodily injury or death to a person insured under the contract,

- (a) the person insured under the contract, or someone on his behalf, shall report the accident within twenty-four hours, or as soon as practicable thereafter, to a police, peace or judicial officer or to an administrator of motor vehicle laws and shall file with the Insurer within thirty days, or as soon as practicable thereafter, a written statement that the person insured under the contract or his representative has a cause or causes of action arising out of such accident for damages against a person or persons whose identity cannot be ascertained and setting forth the facts in support thereof, and
- (b) at the request of the Insurer, the person insured under the contract or his representative referred to in paragraph (a) shall make available for inspection the automobile of which the person insured under the contract was an occupant at the time of the accident.

5. Determination of Legal Liability and Amount of Damages

- (1) The determination as to whether the person insured under the contract is legally entitled to recover damages and, if so entitled, the amount thereof shall be determined,
 - (a) by agreement between the person insured under the contract and the Insurer;
 - (b) at the request of the person insured under the contract, and with the consent of the Insurer, by arbitration by some person to be chosen by both parties, or if they cannot agree on one person, then by two persons, one to be chosen by the person insured under the contract and the other by the Insurer and a third person to be appointed by the persons so chosen; or
 - (c) by a court of competent jurisdiction in Ontario in an action brought against the Insurer by the person insured under the contract, and unless the determination has been previously made in a contested action by a court of competent jurisdiction in Ontario, the Insurer may include in its defence the determination of liability and the amount thereof.
- (2) The Arbitrations Act applies to every arbitration under paragraph (b) of subclause (1) of this Clause.

6. Notice of Legal Action

- (1) Where the person insured under the contract or his representative commences a legal action for damages against any other person owning or operating an automobile involved in the accident, a copy of the writ of summons or other proceeding shall be delivered or sent by registered mail immediately to the chief agency or head office of the Insurer in Ontario.
- (2) Subject to Clause 3 of this Subsection 3, where the person insured under the contract or his representative obtains a judgment against the other person referred to in subclause (1) of this clause but is unable to recover, or to recover fully the amount of that judgment, the Insurer shall, on request, pay the amount of that judgment or, as the case may be, the difference between what he has recovered under that judgment and the amount of that judgment.
- (3) Before making any payment under subclause (2) of this clause, the Insurer may require that the person insured under the contract or his representative assign his judgment, or the balance of his judgment, as the case may be, to the Insurer and the Insurer shall account to the person insured under the contract for any recovery it makes under that judgment for any amount in excess of what it has paid to that person and its costs.

7. Notice and Proof of Claim

- (1) In respect of a claim for bodily injuries or death, the person insured under the contract or his representative, or the person otherwise entitled to make claim or his representative, shall,
 - (a) give written notice of claim to the Insurer by delivery thereof or by sending it by registered mail to the chief agency or head office of the Insurer in Ontario, within thirty days from the date of the accident or as soon as practicable thereafter;
 - (b) within ninety days from the date of the accident for which the claim is made, or as soon as practicable thereafter, furnish to the Insurer such proof of claim as is reasonably possible in the circumstances of the happening of the accident and the loss occasioned thereby;
 - (c) if so required by the Insurer, furnish a certificate as to the cause and nature of the accident for which the claim is made and as to the duration of the disability caused thereby from a medical practitioner legally qualified to practise; and

- (d) give details to the Insurer of any policies of insurance, other than policies of life insurance, to which such person may have recourse.

- (2) In respect of a claim for damage to the insured automobile or its contents, or to both the insured automobile and its contents, the provisions of statutory condition 4 of subsection 2 of section 207 of The Insurance Act apply with necessary modifications to the insured automobile and to any contents with respect to which a claim is made.

8. Medical Reports

- (1) The Insurer has the right and the claimant shall afford to the Insurer an opportunity to examine the person of the person insured under the contract when and as often as it reasonably requires while the claim is pending, and also, in the case of the death of the person insured under the contract, to make an autopsy subject to the law relating to autopsies.
- (2) At the request of the claimant or his representative, the Insurer shall supply to the claimant or his representative, as the case may be, a copy of any medical or autopsy report obtained as a result of an examination or autopsy under subclause (1) of this clause.

9. When Moneys Payable

- (1) No person shall bring an action to recover the amount of a claim provided for under the contract pursuant to subsection 1 of section 231 of The Insurance Act unless the requirements of this subsection 3 have been complied with.
- (2) Every action or proceeding against the Insurer for the recovery of a claim shall be commenced within two years from the date on which the cause of action against the Insurer arose and not afterwards.

10. Limitation of Benefit Payable

Where a person is entitled to benefits under more than one contract providing insurance of the type set forth in subsection 1 of Section 231 of The Insurance Act, he or his representative, or any person claiming through or under him or by virtue of The Family Law Reform Act, 1978 may recover only an amount equal to one benefit.

11. Application of General Provisions

- (1) In so far as applicable the general provisions, definitions, exclusions and statutory conditions of this policy also apply to payments under this subsection 3.
- (2) Special Provisions, Definitions and Exclusions of Section B of this policy do not apply to the insurance provided by this subsection 3.

SPECIAL PROVISIONS, DEFINITIONS, AND EXCLUSIONS OF SECTION B

(1) "INSURED PERSON" DEFINED

In this section, the words "insured person" mean,

- (a) any person while an occupant of the described automobile or of a newly acquired or temporary substitute automobile as defined in this policy;
- (b) the insured and, if residing in the same dwelling premises as the insured, his or her spouse and any dependent relative of either while an occupant of any other automobile, provided that,
 - (i) the insured is an individual or are husband and wife;
 - (ii) such person is not engaged in the business of selling, repairing, maintaining, servicing, storing, or parking automobiles at the time of the accident;
 - (iii) such other automobile is not owned or regularly or frequently used by the insured or by any person or persons residing in the same dwelling premises as the insured;
 - (iv) such other automobile is not owned, hired, or leased by an employer of the insured or by an employer of any person or persons residing in the same dwelling premises as the insured;
 - (v) such other automobile is not used for carrying passengers for compensation or hire or for commercial delivery;
- (c) in subsections 1 and 2 of this section only, any person, not the occupant of an automobile or of railway rolling-stock that runs on rails, who is struck, in Canada, by the described automobile or a newly acquired or temporary substitute automobile as defined in the policy;
- (d) in subsections 1 and 2 of this section only, the named insured, if an individual and his or her spouse and any dependent rela-

tive residing in the same dwelling premises as the named insured, not the occupant of an automobile or of railway rolling-stock that runs on rails, who is struck by any other automobile; provided that,

- (i) such person is not engaged in the business of selling, repairing, maintaining, servicing, storing, or parking automobiles at the time of the accident;
- (ii) that automobile is not owned or regularly or frequently used by the insured or by any person or persons residing in the same dwelling premises as the named insured;
- (iii) that automobile is not owned, hired, or leased by an employer of the insured or by an employer of any person or persons residing in the same dwelling premises as the named insured;
- (e) if the insured is a corporation, unincorporated association, or partnership, any employee or partner of the insured for whose regular use the described automobile is furnished, and his or her spouse and any dependent relative of either, residing in the same dwelling premises as such employee or partner, while an occupant of any other automobile of the private passenger or station wagon type; and
- (f) in subsections 1 and 2 of this section only, any employee or partner of the insured, for whose regular use the described automobile is furnished, and his or her spouse and any dependent relative of either, residing in the same dwelling premises as such employee or partner, while not the occupant of an automobile or of railway rolling-stock that runs on rails, who is struck by any other automobile; provided that, in respect of (e) and (f) above,
 - (i) neither such employee nor partner or his or her spouse is the owner of an automobile of the private passenger or station wagon type;
 - (ii) the described automobile is of the private passenger or station wagon type;
 - (iii) such person is not engaged in the business of selling, repairing, maintaining, servicing, storing, or parking automobiles at the time of the accident;
 - (iv) such other automobile is not owned or regularly or frequently used by the employee or partner, or by any person or persons residing in the same dwelling premises as such employee or partner;
 - (v) such other automobile is not owned, hired, or leased by the insured or by an employer of any person or persons residing in the same dwelling premises as such employee or partner of the insured;
 - in respect of (e) above only,
 - (vi) such other automobile is not used for carrying passengers for compensation or hire or for commercial delivery.

(2) EXCLUSIONS

- (a) Except as provided in Part III of Subsection 2, the Insurer shall not be liable under this section for bodily injury to or death of any person,
 - (i) resulting from the suicide of such person or attempt thereat, whether sane or insane; or
 - (ii) who is entitled to receive the benefits of any workmen's compensation law or plan; or
 - (iii) caused directly or indirectly by radioactive material;
- (b) The insurer shall not be liable under subsection 1 or Part II of subsection 2 of this section for bodily injury or death,
 - (i) sustained by any person who is convicted of drunken or impaired driving or of driving while under the influence of drugs at the time of the accident; or
 - (ii) sustained by any person driving the automobile who is not for the time being either authorized by law or qualified to drive the automobile.

(3) NOTICE AND PROOF OF CLAIM

- The insured person or his agent, or the person otherwise entitled to make claim or his agent, shall,
 - (a) give written notice of claim to the Insurer by delivery thereof or by sending it by registered mail to the chief agency or head office of the Insurer in the Province, within 30 days from the date of the accident or as soon as practicable thereafter;
 - (b) within 90 days from the date of the accident for which the claim is made, or as soon as practicable thereafter, furnish to the Insurer such proof of claim as is reasonably possible in the circumstances of the happening of the accident and the loss occasioned thereby;
 - (c) if so required by the Insurer, furnish a certificate as to the cause and nature of the accident for which the claim is made and as to the duration of the disability caused thereby from a medical practitioner legally qualified to practise.

(4) MEDICAL REPORTS

The Insurer has the right and the claimant shall afford to the Insurer, an opportunity to examine the person of the insured person when and as often as it reasonably requires while the claim is pending, and also, in the case of the death of the insured person, to make an autopsy subject to the law relating to autopsies.

(5) "PHYSICIAN" DEFINED

"Physician" means a legally qualified medical practitioner.

(6) RELEASE

Notwithstanding any release provided for under the relevant sections of The Insurance Act the Insurer may demand, as a condition precedent to payment of any amount under this section of the policy, a release in favour of the insured and the Insurer from liability to the extent of such payment from the insured person or his personal representative or any other person.

(7) WHEN MONEYS PAYABLE

- (a) All amounts payable under this section, other than benefits under Part II of subsection 2, shall be paid by the Insurer within 30 days after it has received proof of claim. The initial benefits for loss of time under Part II of subsection 2 shall be paid within 30 days after it has received proof of claim, and payments shall be made thereafter within each 30-day period while the Insurer remains liable for payments if the insured person, whenever required to do so, furnishes prior to payment proof of continuing disability.
- (b) No person shall bring an action to recover the amount of a claim under this section unless the requirements of provisions 3 and 4 are complied with, nor until the amount of the loss has been ascertained as provided in this section.
- (c) Every action or proceeding against the Insurer for the recovery of a claim under this section shall be commenced within one year from the date on which the cause of action arose and not afterwards.

(8) LIMITATION ON BENEFIT PAYABLE

Where a person is entitled to benefits under more than one contract providing insurance of the type set forth in subsection 1 or 2, he or his personal representative or any person claiming through or under him or by virtue of The Fatal Accidents Act, may recover only an amount equal to one benefit.

In so far as applicable the general provisions, definitions, exclusions and statutory conditions of the policy also apply.

SECTION C — LOSS OF OR DAMAGE TO INSURED AUTOMOBILE

The Insurer agrees to indemnify the insured against direct and accidental loss of or damage to the automobile, including its equipment

Subsection 1 — ALL PERILS — from all perils;

Subsection 2 — COLLISION OR UPSET — caused by collision with another object or by upset;

Subsection 3 — COMPREHENSIVE — from any peril other than by collision with another object or by upset;

The words "another object" as used in this subsection 3 shall be deemed to include (a) a vehicle to which the automobile is attached and (b) the surface of the ground and any object thereon or thereon. Loss or damage caused by missiles, falling or flying objects, fire, theft, explosion, earthquake, windstorm, hail, rising water, malicious mischief, riot or civil commotion shall be deemed loss or damage caused by perils for which insurance is provided under this subsection 3.

Subsection 4 — SPECIFIED PERILS — caused by fire, lightning, theft or attempt thereat, windstorm, earthquake, hail, explosion, riot or civil commotion, falling or forced landing of aircraft or of parts thereof, rising water, or the stranding, sinking, burning, derailment or collision of any conveyance in or upon which the automobile is being transported on land or water;

DEDUCTIBLE CLAUSE

Each occurrence causing loss or damage covered under any subsection of section C except loss or damage caused by fire or lightning or theft of the entire automobile covered by such subsection, shall give rise to a separate claim in respect of which the Insurer's liability shall be limited to the amount of loss or damage in excess of the amount deductible, if any, stated in the applicable subsection of section C of item 4 of the application.

EXCLUSIONS

The Insurer shall not be liable,

- (1) under any subsection of section C for loss or damage
 - (a) to tires or consisting of or caused by mechanical fracture or breakdown of any part of the automobile or by rusting, corrosion, wear and tear, freezing, or explosion within the combustion chamber, unless the loss or damage is coincident with other loss or damage covered by such subsection or is caused by fire, theft or malicious mischief covered by such subsection; or

- (b) caused by the conversion, embezzlement, theft or secretion by any person in lawful possession of the automobile under a mortgage, conditional sale, lease or other similar written agreement; or
 - (c) caused by the voluntary parting with title or ownership, whether or not induced to do so by any fraudulent scheme, trick, device or false pretense, or
 - (d) caused directly or indirectly by contamination by radioactive material; or
 - (e) to contents of trailers or to rugs or robes; or
 - (f) to tapes and equipment for use with a tape player or recorder when such tapes or equipment are detached therefrom; or
 - (g) where the insured drives or operates the automobile
 - (i) while under the influence of intoxicating liquor or drugs to such an extent as to be for the time being incapable of the proper control of the automobile; or
 - (ii) while in a condition for which he is convicted of an offence under section 234 or section 235 of the Criminal Code (Canada) or under or in connection with circumstances for which he is convicted of an offence under section 235(2) of the Criminal Code (Canada); or
 - (h) where the insured permits, suffers, allows or connives at the use of the automobile by any person contrary to the provisions of (g);
- 2) under subsections 3 (Comprehensive), 4 (Specified Perils) only, for loss or damage caused by theft by any person, or persons residing in the same dwelling premises as the insured, or by any employee of the insured engaged in the operation, maintenance or repair of the automobile whether the theft occurs during the hours of such service or employment or not.

**See also General Provisions, Definitions, Exclusions
and Statutory Conditions of this policy
ADDITIONAL AGREEMENTS OF INSURER**

- 1) Where loss or damage arises from a peril for which a premium is specified under a subsection of this section, the Insurer further agrees:
 - (a) to pay general average, salvage and fire department charges and customs duties of Canada or of the United States of America for which the Insured is legally liable;
 - (b) to waive subrogation against every person who, with the insured's consent, has care, custody or control of the automobile, provided always that this waiver shall not apply to any person (1) having such care, custody or control in the course of the business of selling, repairing, maintaining, servicing, storing or parking automobiles, or (2) who has (i) committed a breach of any condition of this policy or (ii) driven or operated the automobile in the circumstances referred to in (i) or (ii) of paragraph (g) of the Exclusions to Section C of this policy;
 - (c) to indemnify the insured and any other person who personally drives a temporary substitute automobile as defined in the General Provisions of this policy against the liability imposed by law or assumed by the insured or such other person under any contract or agreement for direct and accidental physical loss or damage to such automobile and arising from the care, custody and control thereof; provided always that:
 - (i) such indemnity is subject to the deductible clause and exclusions of each such subsection;
 - (ii) if the owner of such automobile has or places insurance against any peril insured by this section, the indemnity provided herein shall be limited to the sum by which the deductible amount, if any, of such other insurance exceeds the deductible amount stated in the applicable subsection of this policy;
 - (iii) the Additional Agreements under section A of this policy shall, insofar as they are applicable, extend to the indemnity provided herein.
- (2) Loss of Use by Theft — Where indemnity is provided under subsections 1, 3 or 4 of section C hereof the Insurer further agrees, following a theft of the entire automobile covered thereby, to reimburse the insured for expense not exceeding \$25.00 for any one day nor totalling more than \$750.00 incurred for the rental of a substitute automobile including taxicabs and public means of transportation. Reimbursement is limited to such expense incurred during the period commencing seventy-two hours after such theft has been reported to the Insurer or the police and terminating, regardless of the expiration of the policy period, (a) upon the date of the completion of repairs to or the replacement of the property lost or damaged, or (b) upon such earlier date as the Insurer makes or tenders settlement for the loss or damage caused by such theft.

**GENERAL PROVISIONS, DEFINITIONS
AND EXCLUSIONS**

- 1. **TERRITORY**
This policy applies only while the automobile is being operated, used, stored or parked within Canada, the United States of America or upon a vessel plying between ports of those countries.
 - 2. **OCCUPANT DEFINED**
In this policy the word "occupant" means a person driving, being carried in or upon or entering or getting on to or alighting from an automobile.
 - 3. **CONSENT OF OWNER**
No person shall be entitled to indemnity or payment under this policy who is an occupant of any automobile which is being used without the consent of the owner thereof.
 - 4. **GARAGE PERSONNEL EXCLUDED**
No person who is engaged in the business of selling, repairing, maintaining, storing, servicing or parking automobiles shall be entitled to indemnity or payment under this policy for any loss, damage, injury or death sustained while engaged in the use or operation of or while working upon the automobile in the course of that business or while so engaged is an occupant of the described automobile or a newly acquired automobile as defined in this policy, unless the person is the owner of such automobile or his employee or partner.
 - 5. **AUTOMOBILE DEFINED**
In this policy except where stated to the contrary the words "the automobile" mean:
 - Under sections A (Third Party Liability), B (Accident Benefits), C (Loss of or Damage to Insured Automobile)
 - (a) The Described Automobile — an automobile, trailer or semi-trailer specifically described in the policy or within the description of insured automobiles set forth therein;
 - (b) A Newly Acquired Automobile — an automobile, ownership of which is acquired by the insured and, within fourteen days following the date of its delivery to him, notified to the Insurer in respect of which the insured has no other valid insurance, if either it replaces an automobile described in the application or the Insurer insures (in respect of the section or subsection of the Insuring Agreements under which claim is made) all automobiles owned by the insured at such delivery date and in respect of which the insured pays any additional premium required; provided however, that insurance hereunder shall not apply if the insured is engaged in the business of selling automobiles;
- and under sections A (Third Party Liability), B (Accident Benefits) only
- (c) A Temporary Substitute Automobile — an automobile not owned by the insured, nor by any person or persons residing in the same dwelling premises as the insured, while temporarily used as the substitute for the described automobile which is not in use by any person insured by this policy, because of its breakdown, repair, servicing, loss, destruction or sale;
 - (d) Any automobile of the private passenger or station wagon type, other than the described automobile, while personally driven by the insured, or by his or her spouse if residing in the same dwelling premises as the insured, provided that
 - (i) the described automobile is of the private passenger or station wagon type;
 - (ii) the insured is an individual or are husband and wife;
 - (iii) neither the insured nor his or her spouse is driving such automobile in connection with the business of selling, repairing, maintaining, servicing, storing or parking automobiles;
 - (iv) such other automobile is not owned or regularly or frequently used by the insured or by any person or persons residing in the same dwelling premises as the insured;
 - (v) such other automobile is not owned, hired or leased by an employer of the insured or by an employer of any person or persons residing in the same dwelling premises as the insured;
 - (vi) such other automobile is not used for carrying passengers for compensation or hire or for commercial delivery;
 - (e) If the insured is a corporation, unincorporated association or registered co-partnership, any automobile of the private passenger or station wagon type, other than the described automobile, while personally driven by the employee or partner for whose regular use the described automobile is furnished, or by his or her spouse if residing in the same dwelling premises as such employee or partner, provided that

- (i) neither such employee or partner or his or her spouse is the owner of an automobile of the private passenger or station wagon type;
 - (ii) the described automobile is of the private passenger or station wagon type;
 - (iii) neither such employee, partner or spouse is driving the automobile in connection with the business of selling, repairing, maintaining, servicing, storing or parking automobiles;
 - (iv) such other automobile is not owned, hired or leased or regularly or frequently used by the insured or such employee or by any partner of the insured or by any persons residing in the same dwelling premises as any of the aforementioned persons;
 - (v) such other automobile is not used for carrying passengers for compensation or hire or commercial delivery;
- (f) Trailers — any trailer used in connection with the automobile.

6. TWO OR MORE AUTOMOBILES

- (a) When two or more automobiles are described hereunder (i) with respect to the use or operation of such described automobiles, each automobile shall be deemed to be insured under a separate policy; (ii) with respect to the use or operation of an automobile not owned by the insured, the limit of the insurer's liability shall not exceed the highest limit applicable to any one described automobile;
- (b) When the insured owns two or more automobiles which are insured as described automobiles under two or more automobile insurance policies, the limit of the insurer under this policy with respect to the use or operation of an automobile not owned by the insured shall not exceed the proportion that the highest limit applicable to any one automobile described in this policy bears to the sum of the highest limits applicable under each policy and in no event shall exceed such proportion of the highest limit applicable to any one automobile under any policy;
- (c) A motor vehicle and one or more trailers or semi-trailers attached thereto shall be held to be one automobile with respect to the limit(s) of liability under Insuring Agreements A and B and separate automobiles with respect to the limit(s) of liability, including any deductible provisions, under Insuring Agreement C.

7. WAR RISKS EXCLUDED

The Insurer shall not be liable under section B or C of this policy for any loss, damage, injury or death caused directly or indirectly by bombardment, invasion, civil war, insurrection, rebellion, revolution, military or usurped power, or by operation of armed forces while engaged in hostilities, whether war be declared or not.

8. EXCLUDED USES

Unless coverage is expressly given by an endorsement of this policy the Insurer shall not be liable under this policy while:

- (a) the automobile is rented or leased to another; provided that the use by an employee of his automobile on the business of his employer and for which he is paid shall not be deemed the renting or leasing of the automobile to another;
- (b) the automobile is used to carry explosives, or to carry radioactive material for research, education, development or industrial purposes, or for purposes incidental thereto;
- (c) the automobile is used as a taxicab, public omnibus, livery, jitney or sightseeing conveyance or for carrying passengers for compensation or hire; provided that the following uses shall not be deemed to be the carrying of passengers for compensation or hire:
 - (i) the use by the insured of his automobile for the carriage of another person in return for the former's carriage in the automobile of the latter;
 - (ii) the occasional and infrequent use by the insured of his automobile for the carriage of another person who shares the cost of the trip;
 - (iii) the use by the insured of his automobile for the carriage of a temporary or permanent domestic servant of the insured or his spouse;

- (iv) the use by the insured of his automobile for the carriage of clients or customers or prospective clients or customers;
- (v) the occasional and infrequent use by the insured of his automobile for the transportation of children to or from school or school activities conducted within the educational program.

STATUTORY CONDITIONS

In these Statutory Conditions, unless the context otherwise requires, the word "insured" means a person insured by this contract whether named or not. With respect to Section B only Statutory Conditions 1, 8 and 9 shall apply.

Material Change in Risk

1. (1) The insured named in this contract shall promptly notify the Insurer or its local agent in writing of any change in the risk material to the contract and within his knowledge.
- (2) Without restricting the generality of the foregoing, the words "change in the risk material to the contract" include:
 - (a) any change in the insurable interest of the insured named in this contract in the automobile by sale, assignment or otherwise, except through change of title by succession, death or proceedings under the *Bankruptcy Act* (Canada); and in respect of insurance against loss of or damage to the automobile,
 - (b) any mortgage, lien or encumbrance affecting the automobile after the application for this contract;
 - (c) any other insurance of the same interest, whether valid or not, covering loss or damage insured by this contract or any portion thereof.

Prohibited Use by Insured

2. (1) The insured shall not drive or operate the automobile,
 - (a) unless he is for the time being either authorized by law or qualified to drive or operate the automobile; or
 - (b) while his licence to drive or operate an automobile is suspended or while his right to obtain a licence is suspended or while he is prohibited under order of any court from driving or operating an automobile; or
 - (c) while he is under the age of sixteen years or under such other age as is prescribed by the law of the province in which he resides at the time this contract is made as being the minimum age at which a licence or permit to drive an automobile may be issued to him; or
 - (d) for any illicit or prohibited trade or transportation; or
 - (e) in any race or speed test.

Prohibited Use by Others

- (2) The insured shall not permit, suffer, allow or connive at the use of the automobile,
 - (a) by any person,
 - (i) unless that person is for the time being either authorized by law or qualified to drive or operate the automobile; or
 - (ii) while that person is under the age of sixteen years or under such other age as is prescribed by the law of the province in which he resides at the time this contract is made as being the minimum age at which a licence or permit to drive an automobile may be issued to him; or
 - (b) by any person who is a member of the household of the insured while his licence to drive or operate an automobile is suspended or while his right to obtain a licence is suspended or while he is prohibited under order of any court from driving or operating an automobile; or
 - (c) for any illicit or prohibited trade or transportation; or
 - (d) in any race or speed test.

Requirements Where Loss or Damage to Persons or Property

3. (1) The insured shall,
 - (a) promptly give to the Insurer written notice, with all available particulars, of any accident involving loss or damage to persons or property and of any claim made on account of the accident;
 - (b) verify by statutory declaration, if required by the Insurer, that the claim arose out of the use or operation of the automobile and that the person operating or responsible for the operation of the automobile at the time of the accident is a person insured under this contract; and
 - (c) forward immediately to the Insurer every letter, document, advice or writ received by him from or on behalf of the claimant.
- (2) The insured shall not,
 - (a) voluntarily assume any liability or settle any claim except at his own cost; or

(b) interfere in any negotiations for settlement or in any legal proceeding.

- (3) The insured shall, whenever requested by the Insurer, aid in securing information and evidence and the attendance of any witness and shall co-operate with the Insurer, except in a pecuniary way, in the defence of any action or proceeding or in the prosecution of any appeal.

Requirements Where Loss or Damage to Automobile

6. (1) Where loss of or damage to the automobile occurs, the insured shall, if the loss or damage is covered by this contract,
- (a) promptly give notice thereof in writing to the Insurer with the fullest information obtainable at the time;
 - (b) at the expense of the Insurer, and as far as reasonably possible, protect the automobile from further loss or damage; and
 - (c) deliver to the Insurer within ninety days after the date of the loss or damage a statutory declaration stating, to the best of his knowledge and belief, the place, time, cause and amount of the loss or damage, the interest of the insured and of all others therein, the encumbrances thereon, all other insurance, whether valid or not, covering the automobile and that the loss or damage did not occur through any wilful act or neglect, procurement, means or connivance of the insured.
- (2) Any further loss or damage accruing to the automobile directly or indirectly from failure to protect it as required under sub-condition 1 of this condition is not recoverable under this contract.
- (3) No repairs, other than those that are immediately necessary for the protection of the automobile from further loss or damage, shall be undertaken and no physical evidence of the loss or damage shall be removed,
- (a) without the written consent of the Insurer; or
 - (b) until the Insurer has had a reasonable time to make the examination for which provision is made in statutory condition 5.

Examination of Insured

- (4) The insured shall submit to examination under oath, and shall produce for examination at such reasonable place and time as is designated by the Insurer or its representative all documents in his possession or control that relate to the matters in question, and he shall permit extracts and copies thereof to be made.

Insurer Liable for Cash Value of Automobile

- (5) The Insurer shall not be liable for more than the actual cash value of the automobile at the time any loss or damage occurs, and the loss or damage shall be ascertained or estimated according to that actual cash value with proper deduction for depreciation, however caused, and shall not exceed the amount that it would cost to repair or replace the automobile, or any part thereof, with material of like kind and quality, but, if any part of the automobile is obsolete and out of stock, the liability of the Insurer in respect thereof shall be limited to the value of that part at the time of loss or damage, not exceeding the maker's latest list price.

Repair or Replacement

- (6) Except where an appraisal has been made, the Insurer, instead of making payment, may, within a reasonable time, repair, rebuild or replace the property damaged or lost with other of like kind and quality if, within seven days after the receipt of the proof of loss, it gives written notice of its intention to do so.

No Abandonment; Salvage

- (7) There shall be no abandonment of the automobile to the Insurer without the Insurer's consent. If the Insurer exercises the option to replace the automobile or pays the actual cash value of the automobile, the salvage, if any, shall vest in the Insurer.

In Case of Disagreement

- (8) In the event of disagreement as to the nature and extent of the repairs and replacements required, or as to their adequacy, if effected, or as to the amount payable in respect of any loss or damage, those questions shall be determined by appraisal as provided under *The Insurance Act* before there can be recovery under this contract, whether the right to recover on the contract is disputed or not, and independently of all other questions. There shall be no right to an appraisal until a specific demand therefor is made in writing and until after proof of loss has been delivered.

Inspection of Automobile

5. The insured shall permit the Insurer at all reasonable times to inspect the automobile and its equipment.

Time and Manner of Payment of Insurance Money

6. (1) The Insurer shall pay the insurance money for which it is liable under this contract within sixty days after the proof of loss has been received by it or, where an appraisal is made under sub-condition 8 of statutory condition 4, within fifteen days after the award is rendered by the appraisers.

When Action May Be Brought

- (2) The insured shall not bring an action to recover the amount of a claim under this contract unless the requirements of statutory conditions 3 and 4 are complied with or until the amount of the loss has been ascertained as therein provided or by a judgment against the insured after trial of the issue or by agreement between the parties with the written consent of the Insurer.

Limitation of Actions

- (3) Every action or proceeding against the Insurer under this contract in respect of loss or damage to the automobile shall be commenced within one year next after the happening of the loss and not afterwards and in respect of loss or damage to persons or property shall be commenced within one year next after the cause of action arose and not afterwards.

Who May Give Notice and Proofs of Claim

7. Notice of claim may be given and proofs of claim may be made by the agent of the insured named in this contract in case of absence or inability of the insured to give the notice or make the proof, such absence or inability being satisfactorily accounted for or, in the like case or if the insured refuses to do so, by a person to whom any part of the insurance money is payable.

Termination

8. (1) This contract may be terminated,
- (a) by the Insurer giving to the insured fifteen days' notice of termination by registered mail or five days' written notice of termination personally delivered;
 - (b) by the insured at any time on request.
- (2) Where this contract is terminated by the Insurer,
- (a) the Insurer shall refund the excess of premium actually paid by the insured over the *pro rata* premium for the expired time, but in no event shall the *pro rata* premium for the expired time be deemed to be less than any minimum retained premium specified; and
 - (b) the refund shall accompany the notice unless the premium is subject to adjustment or determination as to the amount, in which case the refund shall be made as soon as practicable.
- (3) Where this contract is terminated by the insured, the Insurer shall refund as soon as practicable the excess of premium actually paid by the insured over the short rate premium for the expired time, but in no event shall the short rate premium for the expired time be deemed to be less than any minimum retained premium specified.
- (4) The refund may be made by money, postal or express company money order or cheque payable at par.
- (5) The fifteen days mentioned in clause a of sub-condition 1 of this condition commences to run on the day following the receipt of the registered letter at the post office to which it is addressed.

Notice

9. Any written notice to the Insurer may be delivered at, or sent by registered mail to, the chief agency or head office of the Insurer in the Province. Written notice may be given to the insured named in this contract by letter personally delivered to him or by registered mail addressed to him at his latest post office address as notified to the Insurer. In this condition, the expression "registered" means registered in or outside Canada.

APPENDIX XI

AGREEMENT made this day of , A.D. 1978

B E T W E E N:

HER MAJESTY THE QUEEN IN RIGHT OF
THE PROVINCE OF ONTARIO, represented
herein by the Minister of Health for
the Province of Ontario,

(hereinafter called "the Minister")

OF THE FIRST PART

- and -

(hereinafter called "the Insurer")

OF THE SECOND PART

WHEREAS section 35 of The Health Insurance Act, 1972 (hereinafter referred to as "the Act") provides that where, as a result of the negligence or other wrongful act or omission of another, an insured person suffers personal injuries for which he receives insured services under the Act, the Plan is subrogated to any right of the insured person to recover the cost incurred for past insured services and the cost that will probably be incurred for future insured services;

AND WHEREAS section 40 of the Act provides that a liability insurer may pay to the Treasurer of Ontario any amount referable to a claim for recovery of the cost of insured services and such payment discharges the obligation of the liability insurer to pay that amount to the insured person;

AND WHEREAS the Minister and the Insurer have estimated that the total amount paid by the Insurer to the Ontario Health Insurance Plan (hereinafter referred to as "the Plan") in each calendar year heretofore, in respect of claims made pursuant to the Plan's subrogated rights against persons insured by the Insurer under automobile liability policies, is approximately two (2) per cent of the gross automobile third party liability premiums payable to the Insurer in such calendar year in respect of business transacted in Ontario;

ACCORDINGLY the Minister and the Insurer have agreed that, for the purpose of simplifying their administrative procedures and of reducing their administrative costs, the collective subrogated claims of the Plan in respect of causes of action arising after the 30th day of November, 1978, will be settled in advance by payment by the Insurer on the basis hereinafter set out;

DEFINITIONS

- 2.1 "annual settlement amount" means the total amount payable by the Insurer in each calendar year, pursuant to section 3.1.
- 2.2 "applicable percentage" means,
- (a) for a calendar year for which the bodily injury factor does not exceed .95 or exceeds 1.05, the percentage set out opposite the bodily injury factor in Table 1; and
 - (b) for any other calendar year, 2 per cent, subject to section 3.5.
- 2.3 "bodily injury factor", for a specific calendar year, means the ratio of the mean bodily injury ratio applicable to such year to the mean bodily injury ratio applicable to the calendar year 1979.
- 2.4 "bodily injury ratio" for a fiscal policy year statistical period means the result obtained by dividing the Loss Cost per Car Insured for the said period, as set out under the heading "Bodily Injury Liability Loss Statistics" in the Green Book Exhibits, by the corresponding Loss Cost per Car Insured set out under the heading "Bodily Injury and Property Damage Liability Combined" for the same period in the same Green Book Exhibits.
- 2.5 "cause of action" means the cause of action of a person who is an insured person under the Act.
- 2.6 "Green Book Exhibits" means the "Trend or Loss Cost Exhibits, Third Party Liability - Private Passenger Automobiles - Excluding Farmers" shown for Ontario in the publication of Automobile Insurance Experience compiled under the Superintendent of Insurance's Statistical Plan.
- 2.7 "gross premiums" means the gross third party liability premiums under policies of automobile insurance that become payable to the Insurer or any of its agents during a calendar year in respect of business transacted in Ontario, other than premiums in respect of re-insurance

- ceded to the Insurer by other insurers after deducting from such premiums,
- (a) cash value of dividends to policyholders;
 - (b) premiums returned.
- 2.8 "mean bodily injury ratio", as applicable to a specific calendar year, means one-third of the sum of the bodily injury ratios for the fiscal policy year statistical periods ending on the 30th day of June in the 1st, 2nd and 3rd years next preceding the said calendar year, as derived from the Green Book Exhibits compiled as of December 31st of the calendar year next preceding the said calendar year.
- 2.9 "reported gross premiums" means the gross premiums reported by the Insurer to the Superintendent of Insurance for Ontario pursuant to section 79 of The Insurance Act or any amendments thereto.
- 2.10 All references in this Agreement to data derived from the Green Book Exhibits will be construed to refer only to data in respect of the Province of Ontario.

SETTLEMENT PAYMENTS

- 3.1 (1) For each calendar year, the Insurer will pay to the Plan an amount equal to the applicable percentage of the Insurer's gross premiums for that year.
- (2) Notwithstanding subsection (1), for the calendar year 1979 the Insurer will pay to the Plan an amount equal to five-sixths of the applicable percentage of the Insurer's gross premiums for that year.
- 3.2 In determining the amount payable under section 3.1 every premium that by the terms of the policy or renewal thereof becomes payable in respect of insurance of a person resident or property situate in Ontario at the time such premium becomes payable whether or not,
- (a) such premium is earned wholly or partly in Ontario,
 - (b) the business in respect of the policy is transacted wholly or partly in Ontario, or
 - (c) the payment of such premiums is made wholly or

partly in Ontario,
shall be deemed to be a premium payable in respect of
business transacted in Ontario.

3.3 The Insurer will make the payments referred to in
section 3.1 in the following manner:

- (1) On or before the last day of each calendar month
commencing with the last day of March, 1979, the
Insurer will pay an instalment equal to one-twelfth
of the product of 2 per cent and
 - (a) in the case of a payment due on the last day of
January or February, the Insurer's reported
gross premiums for the second calendar year
next preceding the calendar year in which the
payment is required to be made; and
 - (b) in the case of a payment due on the last day of
any other month, the Insurer's reported gross
Premiums for the calendar year next preceding
the calendar year in which the payment is
required to be made.
- (2) Where the aggregate of the amounts paid by the
Insurer pursuant to subsection (1) for a calendar
year is less or greater than the product of the
Insurer's reported gross premiums for such
calendar year and the correct applicable per-
centage for such calendar year, the Insurer will
pay the deficiency or the Minister will refund
refund the excess of payment, as the case may
be, on or before the 31st day of March in the
year next following such calendar year
(hereinafter called "the date of adjustment").
- (3) Where, subsequent to the date of adjustment, it
is ascertained that the Insurer's actual gross
premiums were less or greater than the reported
gross premiums, the Insurer will forthwith pay
the resulting balance owing or the Minister will
forthwith refund the resulting excess of amounts

paid, as the case may be.

INTEREST

- 3.4 (1) Where all or any part of an amount required to be paid by subsection (1) of section 3.3 is not paid on or before the date prescribed therein, the Insurer will pay interest on the unpaid amount from the prescribed date to the date of payment or to the date of adjustment, whichever is earlier, at the rate provided for in subsection 2 of section 149 of The Corporations Tax Act, 1972, or any amendments thereto.
- (2) Any amounts payable by the Insurer or by the Minister under this Agreement (including any amounts payable by way of interest) which have not been paid on or before the date of adjustment will be paid with interest from the date of adjustment to the date of payment, at the rate provided for
- (a) in the case of payment by the Insurer, in subsection 1 of section 149 of The Corporations Tax Act, 1972, or any amendments thereto; and
- (b) in the case of payment by the Minister, in subsection 3 of section 152 of The Corporations Tax Act, 1972, or any amendments thereto.
- 3.5 The applicable percentage for any calendar year in which
- (a) the tax rate prescribed in clause (b) of subsection 1 of section 143 of The Corporations Tax Act, 1972, or any amendments thereto is greater or less than 3 per cent; or
- (b) the Insurer is, by virtue of subsection 4 of the said section 143, not required to pay the premium tax,

will be the product of the applicable percentage indicated in section 2.2 and the fraction $\frac{100-T}{97}$, T being the aggregate of the products of each different tax rate in effect at any time during such year and the proportion of the part of the calendar year during which such rate was in effect to the whole year.

- 3.6 For the purposes of section 3.5, the tax rate in effect during any period when the said section 143 provided that the Insurer was not required to pay the premium tax will be deemed to be 0 per cent.

PAYMENT DISCHARGES OBLIGATION

- 4.1 Payment by the Insurer of the annual settlement amount under section 3.1 discharges the Insurer's obligations in respect of causes of action arising up to the last day of the ninth month of the calendar year to which the annual settlement amount is related, (for example, payment of the annual settlement amount for the calendar year 1980 discharges the Insurer's obligations in respect of causes of action arising to the 30th day of September, 1980).
- 4.2 Notwithstanding section 4.1, nothing in this Agreement affects the Plan's rights in respect of any cause of action arising before the 1st day of December, 1978.

- 4.3 Nothing in this Agreement affects any cause of action other than a cause of action arising
- a) after the 30th day of November, 1978, and
 - b) out of the ownership, use or operation of an automobile which was, on the date the cause of action arose, the subject of a permit issued under subsection 3 of section 6 of The Highway Traffic Act or any amendment thereto, and then only to the extent that the loss or damage giving rise to the cause of action is insured against by the Insurer.

AUDIT

- 5.1 The Superintendent of Insurance, the Deputy Superintendent of Insurance, a duly qualified member of his staff, or other auditor designated by the Minister may inspect, examine and audit the books, accounts, reports, records and other documents, wherever situate, of the Insurer for the purpose of ascertaining, establishing or verifying the amount of the Insurer's gross premiums.
- 5.2 The Superintendent of Insurance, the Deputy Superintendent of Insurance, a duly qualified member of his staff, or other auditor designated by the Minister may cause abstracts to be prepared of the books, accounts, reports, records or other documents examined under section 5.1 relating to the Insurer and to the subject matter of the inspection, examination or audit.

TERMINATION

- 6.1 This Agreement shall remain in full force and effect until the 31st day of December, 1980, and thereafter until terminated in accordance with sections 6.2 or 6.3 but not otherwise.
- 6.2 The Insurer may terminate this Agreement as of the 31st day of December in any year after 1979 by giving at least one year's notice in writing to that effect to the Minister.
- 6.3 The Minister may terminate this Agreement as of the 31st day of December in any year after 1979 by giving at least one year's notice in writing to that effect to the Insurer.
- 6.4 In the event of any termination, then subject to section 4.1 the Plan may exercise its subrogated right as though this Agreement had not been entered into.
- 6.5 Any rights and obligations of the Minister and the Insurer not enforced or discharged as of the date of any termination may be enforced and shall be discharged as though there had been no termination, and in particular and without restricting the generality of the foregoing, sections 5.1 and 5.2 continue to apply.

NOTICES

7.1 Every notice provided for or permitted by this Agreement shall be in writing and delivered to or sent by registered mail to the party to whom it is to be given at:

(a) in the case of a notice to the Minister:

Subrogation Division
Ontario Health Insurance Plan
3rd Floor
7 Overlea Blvd.
Toronto, Ontario
M4H 1A9

(b) in the case of a notice to the Insurer:

The principal office or place of
business of the Insurer in Ontario;

or such other address as the party to be notified may from time to time advise the other party in writing.

7.2 Notice sent by registered mail shall be deemed to have been received on the seventh day after the day of mailing, unless received sooner.

AMENDMENTS

8.1 This Agreement may not be altered, amended or otherwise varied except by a subsequent written agreement of equal formality executed by the parties hereto.

ENTIRETY

9.1 It is agreed that this Agreement embodies the entire agreement of the parties hereto with regard to the matters dealt with herein; and that no understanding or agreements, verbal or otherwise, exist between the parties except as herein expressly set out.

SUCCESSORS AND ASSIGNS

10.1 This Agreement shall enure to the benefit of and be binding upon the respective successors and assigns of the parties hereto.

VALIDITY AND INTERPRETATION

11.1 Should any provision or provisions of this Agreement be illegal or unenforceable, it or they shall be considered separate and severable from the Agreement and its remaining provisions shall remain in force and be binding upon the parties hereto as though the said provision or provisions had never been included.

11.2 The validity and interpretation of this Agreement, and of each clause and part thereof, shall be governed by the law of the Province of Ontario.

TABLE 1

BODILY INJURY FACTOR

PERCENTAGE

Over 1.25

Such percentage as the parties hereto shall hereinafter agree to

Over 1.15 but not in excess of 1.25

2.4

Over 1.05 but not in excess of 1.15

2.2

Over .85 but not in excess of .95

1.8

Over .75 but not in excess of .85

1.6

.75 or under

Such percentage as the parties hereto shall hereinafter agree to

IN WITNESS WHEREOF the Minister has hereunto set his hand and seal, and the Insurer has hereto affixed its corporate seal attested by the hands of its duly authorized officers, this day of , 1978.

SIGNED, SEALED AND DELIVERED) HER MAJESTY THE QUEEN in
in the presence of) Right of the Province of
Ontario, as represented by
_____)
(as to the signature of the)
Minister)) Minister of Health for the
Province of Ontario

Minister of Health for the
Province of Ontario

DATED:

1978

HER MAJESTY THE QUEEN in
Right of the Province of
Ontario

- and -

A G R E E M E N T

APPENDIX XII

August 25, 1983

CLASSIFICATION BY AGE, SEX AND MARITAL
STATUS FOR AUTOMOBILE INSURANCE RATES

An opinion prepared for the Insurance Bureau of Canada

Peter W. Hogg, Q.C.,
Professor of Law,
Osgoode Hall Law School,
York University,
Toronto.

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August 25, 1983

CLASSIFICATION BY AGE, SEX AND MARITAL
STATUS FOR AUTOMOBILE INSURANCE RATES

The opinion requested

I am asked for my opinion on the question whether the Canadian Charter of Rights and Freedoms prohibits the use by insurance companies of age, sex and marital status as factors in fixing the rates for automobile insurance. I am asked to assume that s.15 of the Charter (the equality clause) is in force, so that the opinion looks ahead to the position on April 17, 1985, when s.15 comes into force. It will be recalled that the Charter came into force on April 17, 1982, but that the operation of s.15 was postponed for three years to provide time for the various governments to make whatever changes were necessary to bring their laws into compliance with s.15. In other words, the question for my opinion is: do automobile insurers have to abandon age, sex and marital status as rating criteria by April 17, 1985?

My conclusions are summarized at the end of this opinion, but for convenience I reproduce them here as well. In my opinion, after April 17, 1985:

1. The use of age as a rating factor for automobile insurance will not contravene the Charter.

2. The use of marital status will probably not contravene the Charter.
3. The use of sex will contravene the Charter.
4. In provinces where rates are set by private insurance companies, and are not subject to any form of government approval, the Charter does not apply to those rates at all: even sex can be used as a rating factor for those rates in those provinces.

The facts

I understand that the use by the automobile insurance industry in Ontario and most other jurisdictions of age, sex and marital status as rating factors is based on the claims experience of the industry. That experience shows that persons under 25 have on average more accidents than persons over 25, that males under 25 have more accidents than females under 25, and that single males under 25 have more accidents than married males under 25.

The theory underlying automobile insurance (like other kinds of insurance) is that each insured should pay a premium which reflects an assessment of the amount of risk which that insured imposes on the system. In making that assessment, the industry tries to identify groups (or cells) of insureds who present similar risks to the system. The objective is to fix the premium for each member of a group at a rate which, when pooled with all the premiums of the other members of the group, will fully pay the cost of insuring that group. The cost consists of the claims, the administrative expenses and a profit. The idea is that no one group should subsidize any other group.

The process of classification which yields the various groups of policyholders is hampered by incomplete information about all the drivers of insured vehicles. It is possible that more abundant information would lead to quite different classifications, but some kinds of information which might indicate accident-proneness

are controversial or entail invasions of privacy or would be costly to collect. Accordingly, the industry classifies on the basis of a number of objective factors which can be readily ascertained and which its previous claims experience shows have predictive value. As noted earlier, three of those factors are age, sex and marital status.

I understand that the industry could abandon the factors of age, sex and marital status, and rely instead upon other more personal factors, such as driving experience, miles driven, pattern of use, convictions, and previous claims. But many of these factors are already employed in addition to age, sex and marital status. Since age, sex and marital status do have independent predictive value, the abandonment of those factors would lead to subsidization of the insurance costs of drivers now assessed most heavily. In other words, the premiums for young single males, which would fall substantially, would no longer cover the cost of supplying their insurance, which would generate losses for the carrier; and the premiums for older persons, which would have to rise, would generate excessive profits for the carrier. This kind of cross-subsidization is resisted by the industry as contrary to sound insurance principles and as giving rise to a variety of fairly serious problems. The effects of eliminating age, sex and marital status are analyzed in Rea and Trebilcock, "Rate Determination in the Automobile Industry in Ontario: the use of Age, Sex and Marital Status as Rating Variables" (a study commissioned by the Insurance Bureau of Canada, 1982).

This opinion proceeds from the premise that age, sex and marital status are factors which have been selected by the insurance industry as rating variables, not by reason of any prejudice against youth or the male sex or the unmarried state but in accordance with insurance principles which are widely accepted within the industry. The question is: do those principles have to be modified to conform to the values now contained in the Charter of Rights?

Governmental participation in rate-fixing

The Charter does not apply to the activities of private individuals, corporations or organizations. By virtue of s.32(1), the Charter applies only to "the Parliament and government of Canada" and to "the legislature and government of each province". The Charter operates as a limitation on the activities of legislative bodies, government officials and other public bodies which derive their powers from statute or regulation. The Charter does not operate as a limitation on private activity. A private employer, landlord or insurance company can discriminate as he, she or it pleases without committing a breach of the Charter. (The inapplicability of the Charter to private activity has not yet been judicially decided, and is not accepted by some lawyers, but in my opinion it is the correct interpretation of s.32(1): see Hogg, Canada Act 1982 Annotated (1982), 76-77; Tarnopolsky and Beaudoin, The Canadian Charter of Rights and Freedoms: Commentary (1982), 44-49, where the point is more fully developed.)

In this respect, the Charter is unlike the Human Rights Codes which have been enacted in every Canadian jurisdiction, and which do prohibit various forms of discrimination by private individuals, corporations or organizations in their capacity as employers, landlords and suppliers of goods, services and facilities. This opinion is not concerned with the question whether the insurance industry's rating criteria are in breach of provincial Human Rights Codes because that question

is separate and independent from the question whether the insurance industry's rating criteria are in breach of the Charter. This opinion is concerned only with the latter question.

It is clear that an insurance company writing automobile insurance in a province in which there is no governmental participation in rate-fixing is free of the Charter. But it is not clear what degree of governmental participation would be regarded by the courts as the action of "the legislature" or "government" of a province (the terms used in s.32(1)) causing the Charter to become applicable. I have not researched the regulatory environment in which the automobile industry operates in each province. But I have been supplied with information by the Insurance Bureau of Canada, and I am relying on that information for the opinions expressed in the next few paragraphs. The situation is so complex that it is possible that I have made some mistakes of detail. However, I describe the situation as I understand it in order to bring out the governing principles of law. If the situation in a particular province is not exactly as I have described it, it should be relatively easy to discern the governing principles of law from the following account and apply them to the correct situation.

The fact that automobile insurance is compulsory in all provinces, and must be available to everyone however poor a risk, has obviously been a major factor in creating a high degree of governmental intervention in the industry. In particular, in those provinces where the Facility Association covers the "residual market"

for high risk drivers who cannot be placed privately, I understand that some form of government approval of rates in the residual market is required by statute or regulation. I am instructed that this is the situation in Prince Edward Island, Nova Scotia, New Brunswick, Ontario and Alberta. For reasons elaborated below, in my opinion, such a requirement in a statute or regulation would constitute action by "the legislature" or "government" of each province which would make the Charter applicable to rates in the residual market. A purely cooperative pooling of the high risks of the residual market, one which was not mandated by provincial law, would not by itself make the Charter applicable to rates in the residual market. I am instructed that this is the situation in Newfoundland, Quebec and the two Territories.

In three provinces, namely, Manitoba, Saskatchewan and British Columbia, all mandatory automobile insurance, including high risks, is written by a provincial Crown corporation. Private insurers are thus virtually excluded from these provinces, although private insurers can supply extended coverage (insurance above the mandatory limits of coverage or insurance against the deductible). In Quebec, the mandatory insurance is split between the provincial Crown corporation, which covers bodily injury, and private insurers, which cover physical damage. Private insurers can also supply extended coverage for bodily injury.

The rates that are set by a provincial Crown corporation would for that reason alone almost certainly be subject to the

Charter: see Hogg, Canada Act 1982 Annotated (1982), 77;

Tarnopolsky and Beaudoin, Canadian Charter of Rights and Freedoms: Commentary (1982), 53-54. As well, I am instructed that in each of the four public-sector provinces the rates which are set by the Crown corporation are also approved by an official or board established by statute. For reasons elaborated later in this opinion, that approval is a second reason why the Crown corporation's rates would be subject to the Charter. In short, there can be no doubt that in each of the four public-sector provinces the Crown corporation's rates have been fixed by action of "the legislature" or "government" of the province (as required by s.32 of the Charter) and that the Charter is applicable to those rates.

I am instructed that in each of the four public-sector provinces (Manitoba, Saskatchewan, British Columbia and Quebec) the premiums charged by private insurers are not regulated. In Manitoba, Saskatchewan and British Columbia, private insurers can only offer extended coverage, and so it is the rates for privately-supplied extended coverage that are unregulated. In Quebec, private insurers can write not only extended coverage but also insurance against physical damage (the Crown corporation covers only bodily injury). These private rates are unregulated. In Quebec, as related earlier, there is also no regulation of rates in the high-risk private-sector residual market. In short, private-sector rates in the four public-sector provinces are not regulated.

In three of the private-sector provinces, namely, Alberta, Newfoundland and New Brunswick, rates of automobile insurance are subject to the prior approval of a rate review board established by statute. If the statutory board actually fixed the rates itself, it is clear that this would constitute action by "the legislature" or "government" of the province so as to make the Charter applicable. In my opinion, the courts would hold that prior approval of rates by the statutory board is no different in law from direct rate-fixing by the statutory board. I conclude, therefore, that the requirement of prior approval constitutes action by "the legislature" or "government" of the province so as to make the Charter applicable to all rates which are subject to the prior-approval system.

In one province, namely, Nova Scotia, there is a "file-and-use" system, under which rates are effective without prior official approval, but the rates must be filed with a rate review board which has the power of disallowance or variation. (Ontario has had a similar system in the statute book for many years, but it has never been proclaimed into force.) The file-and-use system in place in Nova Scotia must be distinguished from a "courtesy filing" in which the filing is made for information purposes only and the recipient board or official possesses no power of disallowance or variation. In my opinion, a court would regard the file-and-use system (under which a government board possesses the power of disallowance or variation) as no different for constitutional purposes than the prior-approval systems. Once again, there is action by "the legislature"

or "government" so as to make the Charter applicable to the rates subject to the file-and-use system.

The provinces of Ontario and Prince Edward Island and the two territories remain to be considered. They have a private automobile industry, and have neither prior-approval nor file-and-use systems in place. They are in the same situation as the private-sector portion of the market in Quebec (physical damage) and in Manitoba, Saskatchewan and British Columbia (extended coverage), where there is also neither prior-approval nor file-and-use systems in place. In my opinion, where premium rates are set by private insurers, and are not regulated under either a prior-approval or a file-and-use system, the rating practices of the industry are not subject to the Charter.

My conclusion that unregulated private-sector rates are not subject to the Charter is not free of doubt. In every province automobile insurance (apart from extended coverage) is required by law to be held by all owners of motor vehicles. In every province private insurers are required by law to be licensed to carry automobile insurance. In every province there is a requirement of law of prior approval by the Superintendent of Insurance of the forms of all policies and endorsements used by the private insurers (which forms do not however disclose rating practices or amounts of premiums). In every province private insurers are subject to the supervision of the Superintendent of Insurance who is under an obligation to see that all laws are enforced. In Ontario (and probably elsewhere)

those laws include a prohibition of "unfair" discrimination in rates and "unfair" practices generally (Insurance Act, R.S.O. 1980, c.218, ss.393, 394). The Superintendent of Insurance in Ontario certainly scrutinizes the classifications employed by insurers, and has, for example, insisted upon the abolition of the 04 classification (unmarried males aged 25 to 29) and the discontinuance of discrimination against elderly drivers - in rates as well as other practices. Thus, even in the provinces that do not approve rates, the regulatory regime is extensive and will impact upon some rating practices. It is possible that a court would accept the argument that the regulation of the automobile insurance industry is so pervasive that it sweeps all industry practices, including rating practices, into the Charter. But I think that the more reasonable conclusion is otherwise. Where rates have been set privately, in response to the play of market forces, and without intervention by government, it seems to me that there is no action by "the legislature" or the "government" of the province, and therefore, by virtue of s.32, the Charter does not apply.

The American case-law supports this conclusion. There is no precise equivalent of s.32 in the American Bill of Rights. But the cases establish that "state action" is required to make the Bill of Rights applicable. The mere fact that an industry is licensed and regulated by the state does not supply sufficient state action to subject the practices of the industry to the Bill of Rights, unless a

state board or official has approved the very practice in issue, or unless government involvement is so pervasive that the industry and the government are in a "symbiotic relationship": see Moose Lodge Number 107 v. Irvis (1972) 407 U.S. 163 (private club could discriminate despite its possession of state liquor licence); Columbia Broadcasting System v. Democratic National Committee (1973) 412 U.S. 94 (television station could refuse editorial advertising despite governmental regulation of television industry); Jackson v. Metropolitan Edison Co. (1974) 419 U.S. 345 (electric company could deny a hearing to terminated customer despite its possession of a state-granted monopoly and government regulation which however did not extend to the termination practices of the company); and see generally Nowak, Rotunda, Young, Constitutional Law (1978), 464-468. I conclude that automobile insurance rates which have not been set by a Crown corporation, and have not been approved by government, are not covered by the Charter.

My conclusions as to the application of the Charter to the rate-fixing practices of the automobile industry are as follows:

1. The Charter applies to rates set by Crown corporations (Manitoba, Saskatchewan, British Columbia, Quebec-bodily injury).
2. The Charter applies to rates which are regulated, either by a prior-approval system (Newfoundland, New Brunswick, Alberta) or by a file-and-use system (Nova Scotia).
3. The Charter does not apply to rates set by private insurers which are not subject to government approval (whether prior-approval

or file-and-use) (Prince Edward Island, Quebec - physical damage, Ontario, the Territories).

4. The high-risk residual market is governed by the previous three rules. The Charter applies to rates in the residual market where they are set by a Crown corporation (Manitoba, Saskatchewan, British Columbia), or where they are subject to government regulation (Prince Edward Island, Nova Scotia, New Brunswick, Ontario, Alberta), but not where the rates are set privately and are not subject to government regulation (Newfoundland, Quebec, the two Territories).

Quebec's override of Charter

Section 33 of the Charter permits the federal Parliament or a provincial Legislature to insert in a statute a clause declaring that the statute is to operate notwithstanding s.2 or ss.7 to 15 of the Charter. When this is done, the statute overrides the Charter instead of vice versa. By the use of s.33, s.15 of the Charter could be overridden - and s.15 is the provision which prohibits discrimination generally. However, s.28 of the Charter cannot be overridden and s.28 is the provision which (at least in concert with s.15) prohibits discrimination on the basis of sex. So the use of the override power probably does not solve the problem of discrimination by sex. In the succeeding sections of this opinion I conclude that the use of age and marital status by the automobile industry do not contravene the Charter anyway, but the use of sex probably does.

I mention s.33 in passing, not because it is likely to be used much, but because it has been used by Quebec with respect to all of Quebec's statutes. This has been done by Bill 62, enacted June 23, 1982, entitled "An Act Respecting the Constitution Act, 1982", 1982 L.Q., c.21. The validity of this use of s.33 has been challenged, but at first instance Bill 62 has been upheld (Alliance de Professeurs de Montréal v. A.-G. Que., Que. S.C., April 27, 1983, not yet reported). If Bill 62 is indeed valid, and if it has not been repealed by April 17, 1985 (when s.15 of the Charter comes into force in the other provinces), then s.15 of the Charter will not apply in Quebec. The public-sector automobile insurance rates

(for bodily injury) would not be subject to s.15, but they probably still could not classify by sex because of s.28. The private-sector automobile insurance rates (for physical damage) are not subject to the Charter anyway, if I am right in the previous section of this paper (p. 13, above).

I conclude that s.33 is not an important consideration for this opinion, even in Quebec.

Age

Introduction

In those provinces in which the Charter applies to the automobile insurance industry in its rate-fixing practices (p.13, above), it is necessary to consider each of the three factors which have been suggested as offensive to the Charter. This section of the opinion will deal with age, the next section will deal with marital status, and the next section will deal with sex.

Section 15

Section 15 of the Charter provides as follows:

- 15.(1) Every individual is equal before and under the law and has the right to the equal protection and equal benefit of the law without discrimination and, in particular, without discrimination based on race, national or ethnic origin, colour, religion, sex, age or mental or physical disability.
- (2) Subsection (1) does not preclude any law, program or activity that has as its object the amelioration of conditions of disadvantaged individuals or groups including those that are disadvantaged because of race, national or ethnic origin, colour, religion, sex, age or mental or physical disability.

It will be observed that subsection (1) expressly prohibits "discrimination based on ... age". Subsection (2) permits "affirmative action" programs which make use of the prohibited factors, but this is not relevant to automobile insurance.

Section 1

The equality rights guaranteed by s.15 are not absolutes. Like other rights in the Charter, they are subject to s.1, which provides as follows:

1. The Canadian Charter of Rights and Freedoms guarantees the rights and freedoms set out in it subject only to such reasonable limits prescribed by law as can be demonstrably justified in a free and democratic society.

The effect of s.1 is that classification by age is not a breach of the Charter if the classification is "reasonable", is "prescribed by law", and "can be demonstrably justified in a free and democratic society".

Burden of proof

The cases decided so far under the Charter have held (correctly, in my view) that the burden of persuading the court that the elements of s.1 have been satisfied rests on the party seeking to uphold the challenged law or practice: see Quebec Association of Protestant School Boards v. A.-G. Que. (1982) 140 D.L.R. (3d) 33, 57-59 (Que. S.C.); Re Skapinker (1983) 40 O.R. (2d) 481, 487 (Ont. C.A.); Re Southam Inc. and the Queen (No. 1) (1983) 41 O.R. (2d) 113, 124-125 (Ont. C.A.). In our context, this means that the insurance industry will carry the burden of satisfying the court that its use of age (and sex and marital status) as a rating factor is "reasonable", is "prescribed by law", and "can be demonstrably justified in a free and democratic society".

Prescribed by law

The requirement of s.1 that the challenged classification be "prescribed by law" is an initial difficulty. The rating classifications which are in issue are not contained in a statute or even in a regulation. In Canada Act 1982 Annotated (1982), 11, I suggested that:

In the context of s.1, it seems plausible to insist that law be enacted by the federal Parliament or provincial Legislature so that the claimed restriction [on a guaranteed right] is the deliberate product of an open parliamentary process. However, the French version which uses the word "droit" (as opposed to "loi") suggests a broader meaning.

However, the courts have not accepted this narrow meaning of "law", and there are dicta to the effect that a limitation would be "prescribed by law" not only if it were contained in a statute, but also if it were contained in a regulation: Federal Republic of Germany v. Rauca (1982) 38 O.R. (2d) 705, 716 (Ont. H.C.); Ont. Film and Video Appreciation Society v. Ont. Bd. of Censors (1983) not yet reported (Ont. Div. Ct.); or in the common law: Federal Republic of Germany v. Rauca (1982) 38 O.R. (2d) 705, 716 (Ont. H.C.); Tarnopolsky and Beaudoin, The Canadian Charter of Rights and Freedoms: Commentary (1982), 62; Manning, Rights, Freedoms and the Courts (1983), 147.

It is probably safe to assume that the courts will continue to give a broad meaning to "law" in "prescribed by law". Probably, therefore, the prior approval of insurance rates by a statutory board

or official, which applies in the public-sector provinces (see p.9, above) and in three of the private-sector provinces (see p.10, above), would suffice to make the approved rates 'prescribed by law'.

Probably, also, the file-and-use system, under which rates are subject to disallowance by a statutory board or official, which applies in one private-sector province (see p.10, above), would suffice to make the filed rates "prescribed by law".

In those provinces where there is no regulation of rates (neither prior-approval nor file-and-use), I have already given as my opinion that the Charter has no application (pp.11-13, above), so it is not necessary to justify industry practices in those provinces under s.1. The question whether insurance rates in those provinces are "prescribed by law" (they probably are not) is accordingly irrelevant.

I conclude that s.1's requirement that discrimination be "prescribed by law" is probably satisfied in those provinces with prior-approval or file-and-use review systems. In those provinces where the industry is still privately owned, and where rates are not subject to any form of government approval, the Charter does not apply and the question whether the rates are "prescribed by law" does not arise.

Reasonable limit that can be demonstrably
justified in a free and democratic society

Section 1's requirement that a limitation on a fundamental freedom be "reasonable" is hard to deal with separately from the requirement that the limitation "can be demonstrably justified in a free and democratic society". These two requirements call for an evaluation of the purpose of a challenged classification, and, if the purpose is legitimate, an evaluation of the justification for the classification as a means of achieving that purpose: see generally Hogg, Canada Act 1982 Annotated (1982), 10; Tarnopolsky and Beaudoin, The Canadian Charter of Rights and Freedoms: Commentary (1982), 62-68; cases cited in Canadian Charter of Rights Annotated (Canada Law Book loose-leaf service) under s.1.

It should not be difficult for the insurance industry to discharge the burden of establishing the legitimacy of the purpose for which age (as well as sex and marital status) is employed as a factor. This involves explaining the insurance principles of pooling similar risks so that each insured pays no more and no less than the cost of the risk which he or she imposes on the system.

It should also not be difficult for the insurance industry

to discharge the burden of establishing that age is a factor which it is reasonable to use in classifying risks, and that the use of age can be demonstrably justified in a free and democratic society. In my opinion, if it can be established that younger drivers as a class do have a higher risk of accidents than older drivers the court would regard the use of age as satisfactorily justified within the meaning of s.1. The industry's claims experience should by itself go a long way to provide the necessary justification. However, the industry would also need to show that age cannot easily be replaced by a non-prohibited criterion of classification, for example, length of driving experience. It will be necessary to develop evidence to the effect that younger drivers are not only less experienced than older drivers, but are less cautious: more inclined to speed, more inclined to take other risks, more inclined to take alcohol or drugs, and so on. Evidence of this kind will be necessary to satisfy the court that the industry is accurately interpreting its claims experience as related to age rather than to some other factor. But I point out that the basic proposition that young people are less cautious than older people is inherently plausible, and is likely to be accepted by a court.

Canadian case-law

No Canadian court has yet ruled on any age-classification under the Charter, and of course no court will have occasion to do so until April 17, 1985, when s.15 comes into force. But the Supreme Court of Canada has considered a challenge to an age-classification made under the equality clause of the Canadian Bill of Rights. In R. v. Burnshine [1975] 1 S.C.R. 693 the Court upheld a power in a federal statute which enabled offenders under 22 to be sentenced to indeterminate sentences in special correctional institutions. The effect of the law was that a person under 22 was liable to a longer sentence than a person over 22 for exactly the same offence. Martland J. for the majority of the Court held that the classification by age should be sustained because it pursued a "valid federal objective". Ritchie J. in a separate concurring opinion added that the age-classification should be sustained because it was "designed for the benefit of the individuals concerned so that they may be afforded the opportunity to play a useful and profitable role in society and to avoid the risk of maturing into hardened criminals". The issue in Burnshine was not quite the same as the issue under the Charter, because of the different language and status of the Canadian Bill of Rights. But the case suggests a readiness by the Court to accept age-classifications which pursue an intelligible purpose.

United States' case-law

In the United States it has also been held that longer (but rehabilitative) sentences for young offenders are not in breach of the

due process or equal protection guarantees of the United States constitution: Cunningham v. United States (1958) 256 F. 2d 467 (U.S.C.A., 5th Cir.); Carter v. United States (1962) 306 F. 2d 283 (U.S.C.A., D.C. Cir.).

Generally speaking, classification by age has been accepted by the Supreme Court of the United States to be in compliance with the equal protection clause of the fourteenth amendment so long as there is a "rational basis" for the classification. Thus, in Massachusetts Board of Retirement v. Murgia (1976) 427 U.S. 307 the Court upheld a state law requiring police officers to retire at age 50. State law also required annual medical examinations for police officers between 40 and 50, and it was conceded that the plaintiff officer (who had been retired at 50) had consistently passed these examinations, was in excellent physical and mental health, and was fully capable of continuing to perform his duties as a police officer. Nonetheless, the Court held that the compulsory retirement at age 50 satisfied the rational basis test. The Court said (at pp.314-315):

Through mandatory retirement at age 50, the legislature seeks to protect the public by assuring the physical preparedness of its uniformed police. Since physical ability generally declines with age, mandatory requirement at 50 serves to remove from police service those whose fitness for uniformed work presumptively has diminished with age. This clearly is rationally related to the State's objective.

The Court in Murgia refused to accept that age was a "suspect category" inviting "strict scrutiny", as it has held with respect to race and

national origin. (A similarly strict scrutiny is applied where fundamental constitutionally-protected rights have been denied: see Carey v. Population Services International (1977) 431 U.S. 678 (prohibition on sale of contraceptives to children under 16 held unconstitutional); but this exception is not relevant for present purposes.) The Court, in holding that age was not a suspect category, pointed out (at pp.313-314) that age "marks a stage that each of us will reach if we live out our normal span", and, unlike "race or national origin", age had never been the basis of systematic discrimination in America. (The standards of judicial review under the equal protection clause of the fourteenth amendment of the Constitution of the United States are discussed in more detail in connection with classification by sex later in this opinion, pp. 34-42, below).

Other age classifications

Wherever age is used as a proxy for maturity, responsibility or competence, a stereotype is created which will not be accurate for particular individuals. There is a minimum age for obtaining a driving licence, for example, although some people under that age would no doubt make excellent drivers. There is a minimum drinking age, although some people under that age would no doubt use alcohol responsibly.

The alternative to the use of age as the regulatory criterion is an individualized judgment as to the capacity of each person to perform the regulated act, whether it be driving, drinking, voting,

making a contract, or whatever. The individualized judgment is so plainly impracticable that our laws have to use objective, general criteria to define capacity, and in many contexts age seems a necessary and reasonable criterion. For this reason, our laws are shot through with classifications by age: driving, drinking, voting, getting married, making contracts, making wills, owning guns, attending school, leaving home, viewing restricted movies, joining the armed forces, being employed, receiving welfare, are among the activities which in all Canadian jurisdictions are regulated by age. All of the laws on the foregoing topics (and a much longer list could no doubt be compiled) classify by age, and therefore ostensibly breach s.15 of the Charter, but I have no doubt that few if any of them will be struck down by the courts. They will be upheld under s.1 as reasonable limits that can be demonstrably justified in a free and democratic society.

The purpose for which the automobile insurance industry uses age actually has quite close analogies in the driving and drinking laws. If it is reasonable to establish a minimum age for driving, is it not also plausible to find that drivers who have recently achieved the requisite age are not yet as competent as older drivers? And, if so, is it not reasonable for the insurance industry to act on that finding? If it is reasonable to establish a minimum drinking age, is it not also plausible to find more alcohol abuse by drivers who have only recently achieved the requisite age than by older drivers? And, if so, is it not reasonable for the insurance industry to act on that finding?

It is necessary to conclude that the insurance industry, by seeking to continue to use age as a rating factor, is not clinging to a criterion generally abandoned elsewhere in our society, but is rather continuing to use a criterion which is widely accepted as relevant in many other societal contexts in Canada as well as in other countries.

Conclusion

While age is a prohibited classification under s.15 of the Charter, s.15, like other guarantees, is subject to s.1, which would sustain an age classification which is "reasonable" and "can be demonstrably justified in a free and democratic society".

Provided that a court is presented with evidence that age is a relevant factor in the assessment of the risk of automobile accidents, in my opinion, a court would find that the use of age as a rating factor for automobile insurance is "reasonable" and "can be demonstrably justified in a free and democratic society". Accordingly, even after s.15 comes into force on April 17, 1985, in my opinion, the use of age as a rating factor for automobile insurance will not contravene the Charter.

Marital status

Sections 15 and 1

Marital status as a rating factor for automobile insurance raises a similar set of issues as age. To be sure, s.15 of the Charter (the text of which is reproduced, p.17, above) does not expressly prohibit discrimination based on marital status, whereas s.15 is express in its prohibition of discrimination based on age. But it is clear that the list of prohibited classifications in s.15 is not exclusive, because it is introduced by the words "in particular". In my opinion, the constitutionality of classification by marital status, like classification by age, depends upon whether the classification can be justified under s.1 of the Charter (the test of which is reproduced, p.18, above), that is, whether it is "prescribed by law", and whether it is a "reasonable" limit which "can be demonstrably justified in a free and democratic society".

Prescribed by law

The question whether marital status as a rating factor is "prescribed by law" is exactly the same issue as whether age is prescribed by law. My opinion on that issue is set out at pp. 19-20, above, with my conclusion at p. 20, above.

Reasonable limit that can be demonstrably justified in a free and democratic society

Is marital status as a rating factor a "reasonable" factor, and one which "can be demonstrably justified in a free and democratic society"?

Marital status is used as a classification in many laws, especially laws relating to the economic situation of families, for example, entitlement to income-tax deductions, to public income-support, housing and other benefits, to spousal maintenance, and so on. So that it could hardly be argued that there is anything inherently objectionable in the use of marital status as a characteristic carrying legal consequences.

However, there are two reasons which lead me to believe that the insurance industry will have more difficulty in supporting the use as a rating factor of marital status than the use of age. First, whereas age is a classification which is widely used in our laws as a proxy for a requirement of maturity, responsibility and competence (see pp. 25-27, above), marital status is to my knowledge nowhere used for that purpose. Thus, the industry's use of marital status is more novel, and certainly less plausible, than its use of age. Secondly, there is the awkward problem of defining marital status, given the variety of living-together relationships now generally accepted by society. In other areas of the law where marital status is important the tendency now is to include "common law" relationships, although these require arbitrary definitions. If the insurance industry were to exclude common law relationships in its statistics of previous claims and its rating practices, it might be hard-pressed to justify the use of marital status as a rating factor. On the other hand, a court would undoubtedly be realistic as to the kind of definition which it is practicable for the industry to administer.

The considerations outlined in the previous paragraph suggest to me that the industry will have to make out a persuasive case for its use of marital status as a factor in setting automobile insurance rates. But I do not believe that there is anything inherently objectionable about the use of marital status (unlike race or national origin, for example), and so I do not feel that the burden of persuasion is impossible to discharge. The question is: can the industry establish the predictive force of the criterion? If a reasonably sound case can be made for the predictive value of marital status as defined by the industry, and for the impracticability to the industry of other definitions of marital status, then it is likely that a court would hold that the use of marital status as a rating factor for automobile insurance is "reasonable" and "can be demonstrably justified in a free and democratic society".

Conclusion

I conclude, although with some doubt, that, even after s.15 comes into force on April 17, 1985, the Charter will not prohibit the use of marital status as a rating factor for automobile insurance.

Sex

Sections 15 and 1

Sex, like age, is one of the bases of discrimination which is expressly prohibited by s.15 of the Charter. (The text of s.15 is reproduced, p. 17, above.) If the Charter contained no other provision regarding sexual discrimination, the constitutionality of a sexual classification would turn on whether the classification could be justified under s.1 of the Charter (the text of which is reproduced, p. 18, above), that is, whether the classification is "reasonable", is "prescribed by law", and "can be demonstrably justified in a free and democratic society". The analysis of the validity of a sexual classification would not be essentially different than the analysis of age and marital status.

Section 28

It is entirely possible that the last two sentences do accurately state the law, but the position is rendered doubtful by the existence of s.28 of the Charter. Section 28 of the Charter provides as follows:

28. Notwithstanding anything in this Charter,
the rights and freedoms referred to in it
are guaranteed equally to male and female
persons.

The meaning of s.28 is far from clear. However, it certainly seems to reinforce the prohibition on sexual discrimination which is

already in s.15. But while s.15 is subject to s.1, the opening words of s.28 ("Notwithstanding anything in this Charter") suggest that s.28 is not subject to s.1. This is the view taken (somewhat hesitantly) by the commentators: Hogg, Canada Act 1982 Annotated (1982), 72; Tarnopolsky and Beaudoin, The Canadian Charter of Rights and Freedoms: Commentary, (1982), 436-437; Tarnopolsky, "The Equality Rights in the Canadian Charter of Rights and Freedoms" (1983) 61 Can. Bar Rev. 242, 259; Gold, "A Principled Approach to Equality Rights" (1982) 4 Supreme Court L.R. 131, 152. The apparent implication of this view that s.28 is not subject to s.1 is that sexual classifications are absolutely forbidden; they are unconstitutional per se; they are not saved even if they are "reasonable", "prescribed by law" and "can be demonstrably justified in a free and democratic society".

This extreme position, which would condemn all sexual classifications, is probably not the correct interpretation of s.28 because it is hard to reconcile with s.15(2). Section 15(2), which makes clear that s.15(1) does not preclude affirmative action programs, expressly refers to programs in favour of "those that are disadvantaged because of ... sex". In interpreting the Charter (like any other instrument) the courts will want to give some effect to each of its provisions; yet the absolutist interpretation of s.28 would prohibit even affirmative action programs in favour of women (or men) despite their explicit recognition in s.15(2). The courts are more likely to prefer an interpretation of the Charter which avoids a clash between ss.28 and 15(2) and which gives some effect

to the reference to sex in s.15(2). Tarnopolsky and Gold, in the works referred to in the previous paragraph, suggest that s.15's prohibition of discrimination (even when reinforced by s.28) is not to be interpreted as an absolute prohibition of all legislative classifications, but only of those classifications which are unreasonable and unjustified. In other words, even without the aid of s.1, a reasonable and justified classification by sex could be upheld.

This is how the equal protection clause of the fourteenth amendment to the Constitution of the United States has been interpreted. There is no equivalent of s.1 in the Constitution of the United States; yet the guarantee of "equal protection of the laws" has not been construed as an absolute prohibition of all legislative classifications, but rather as authorizing review by the courts of each classification's rationale and legitimacy. (A more detailed account of the American law is given later in this opinion: pp.34-42, below.) One difficulty with the application to the Charter of the American theory that requirements of rationality and legitimacy are "built into" the guarantee of equal protection is that it tends to render s.1 of the Charter redundant in its application to s.15.

The foregoing analysis demonstrates, I think, that s.28 of the Charter is an obscure provision which does not fit easily into the rest of the Charter, and certainly does not sit easily with s.15. Section 28 was not in the original (October 1980) version of the Charter but was included later. This is probably the reason for its poor integration into the Charter, but it does not help those of us who have to interpret it.

It is possible that the courts will read s.28 as imposing an absolute prohibition on classifications by sex, however reasonable or well justified. On this view, obviously, the insurance industry would have to abandon sex as a rating factor.

In my opinion, however, it is more likely that the courts will find a way (perhaps by following Tarnopolsky and Gold) to treat s.28 as a qualified prohibition only and one which would not condemn all classifications by sex. However, if this moderate approach prevails (as I believe it will), there is no doubt that the courts will insist upon very strict standards of reasonableness and justification in order to uphold a sexual classification in the face of s.28. The question which remains is: What standards of reasonableness and justification would the industry have to satisfy in order to defend the use of sex? And can the industry provide evidence which would meet those standards?

United States' case-law

As noted earlier in this opinion, the fourteenth amendment of the Constitution of the United States guarantees the "equal protection of the laws". In applying this guarantee to the review of allegedly discriminatory laws, the Supreme Court of the United States has developed a "two-tier" standard of review.

The upper "tier" includes classifications by race (and national origin), which the Court has held are "suspect". Also included in the upper tier (although not relevant to the present

opinion) are laws which, although employing other kinds of classifications, abridge a fundamental right, such as the right to vote. For classifications coming within the upper tier the standard of review is usually described as "strict scrutiny". Such classifications are presumed to be unconstitutional, and will be upheld only if the government establishes that the classification is necessary to a "compelling state interest" and that there is no alternative means of vindicating that state interest. Because it is hard for government to discharge this burden, the practical effect of including a classification in the upper tier is that it is very likely to be held to be unconstitutional. In particular, with the exception of the wartime case of the Japanese Americans, Korematsu v. United States (1944) 323 U.S. 214, the modern Supreme Court of the United States has invariably struck down laws which classified by race. The school desegregation case, Brown v. Board of Education (1954) 347 U.S. 483, is the most famous of many such cases.

The lower "tier" of judicial review under the equal protection clause includes all classifications which are not "suspect" and which do not affect "fundamental" rights. For these classifications a more relaxed standard of judicial review, often described as "minimal scrutiny", is employed. It is sufficient if there is a "rational basis" for the classification. A good example is Massachusetts Board of Retirement v. Murgia (1976) 427 U.S. 307 (mandatory retirement of police officers upheld) which is discussed earlier in this opinion, p. 17, above. Another case often cited is Dandridge v.

Williams (1970) 397 U.S. 471 (dollar limit on income-support for large families upheld). Because it is easy for a government to find a rational basis for a law, the practical effect of including a classification in the lower tier is that it is very unlikely to be held to be unconstitutional.

Sex discrimination has recently disturbed this neat two-tier system, leading to a standard of review which has sometimes been described as "intermediate scrutiny". At first, classifications by sex came within the lower tier and were accordingly usually upheld: e.g., Goesart v. Cleary (1949) 335 U.S. 464 (women ineligible for licensing as bartenders unless related to owner of bar); Hoyt v. Florida (1961) 368 U.S. 57 (women ineligible for mandatory jury service). But in Reed v. Reed (1971) 404 U.S. 71 the Court unanimously struck down a state law which gave preference to men over women in obtaining appointment as administrator of a decedent's estate, and the Court seemed to be applying a somewhat stricter standard of review than the rational basis test. Then in Frontiero v. Richardson (1973) 411 U.S. 677 the Court, by a majority of eight to one, struck down a federal law which prohibited a married female airforce officer from obtaining the same housing and medical benefits as were available to a married male airforce officer. In this case four of the eight judges in the majority held that sex was a suspect category like race or national origin and was accordingly subject to upper tier "strict scrutiny". But the other four majority judges left this issue open, holding that the law could not even satisfy the rational basis test.

The next important case was Craig v. Boren (1976) 429 U.S. 190, the facts of which have some affinity to our present problem. A state law prohibited the sale of beer to males under 21 and females under 18, thereby discriminating against males aged 18 to 21. The state offered statistical evidence which showed that young males were arrested for "driving under the influence" and for "drunkenness" far more frequently than young females, that young males were killed in traffic accidents more frequently than young females, that young males were more inclined to drink and drive than young females, and that drunkenness was a factor in many accidents. Despite this evidence, the Court held, by a majority of seven to two, that the discrimination against young males was unconstitutional. In deciding the case Brennan J. (who had advocated strict scrutiny in Frontiero v. Richardson), with the concurrence of five others, now articulated a test which fell somewhere in between strict scrutiny and minimal scrutiny. He said (at p. 197) that "classifications by gender must serve important governmental objectives and must be substantially related to achievement of those objectives". And he concluded (at p. 204) that this standard had not been met: "the showing offered by the [government] does not satisfy us that sex represents a legitimate, accurate proxy for the regulation of drinking and driving".

After Craig v. Boren the "intermediate scrutiny" which it stipulated was applied in a number of cases involving sexual classifications. In most cases the classification was struck down: although "statutory rape", an offence which in California could be committed

only by a male, was upheld (Michael M. v. Superior Court (1981) 450 U.S. 464), as was the male-only registration system for the military draft (Rostker v. Goldberg (1981) 101 S. Ct. 2646). (The cases are summarized in Nowak, Rotunda, Young, Constitutional Law (1978 and 1982 supplement), 607-619.)

The most recent constitutional case at the time of writing is Mississippi University for Women v. Hogan (1982) 102 S.Ct. 3331 in which the Court, by a majority of five to four, held that the Mississippi University for Women's all-female admissions policy violated the equal protection clause. O'Connor J. for the majority articulated a standard of review that was higher than the Craig v. Boren standard. She said (at p. 3336) that an "exceedingly persuasive justification" was needed to sustain a gender-based classification; and in a footnote (also at p. 3336) she raised and left open the question whether sex should not now be treated as a "suspect" category and thus subject to the same strict scrutiny as race or national origin.

The general trend of this brief history is obvious.

Classification by sex has rapidly moved from the lower "tier", which includes most other classifications and which attracts only minimal judicial scrutiny, to a position which is close to the upper tier, which includes race and national origin and which attracts strict scrutiny. It seems likely, if not inevitable, that sex will soon be treated as no different from race and national origin, in which case virtually all sexual classifications will violate the equal protection clause.

Two further cases should now be considered. Although they are not constitutional cases, they are cases in which the Supreme Court of the United States reviewed (and condemned) the use of sex-based longevity tables in the computation of retirement pensions, and they have a special relevance to the subject of this opinion.

The first case is Los Angeles Department of Water and Power v. Manhart (1978) 435 U.S. 702, in which the Supreme Court of the United States reviewed a city's requirement that its female employees make higher contributions to its pension fund than its male employees. The requirement was based on the fact that (as the Court acknowledged at p. 704) "as a class, women live longer than men", so that the cost of a pension for the average retired female was higher than for the average retired male. Nonetheless, the Court held by a majority of five to three (or six to two - Blackmun J.'s position is not clear; Brennan J. did not participate in the decision; hence only eight judges) that the difference in contributions violated Title VII of the Civil Rights Act of 1964, which made it unlawful for an employer to discriminate against an employee on the basis of (inter alia) the employee's sex.

Manhart was concerned with the pay-in phase of a retirement plan. The pay-out phase came under review in Arizona Governing Committee v. Norris (1983), not yet reported. The State of Arizona, by arrangement with private insurance companies, offered its employees a retirement plan under which the employees could make tax-deductible contributions while employed, and on retirement would receive those contributions together with their accumulated earnings. On retirement, the employee could take his or her benefit under the plan in one of

three forms: (1) as a single lump-sum payment of the total amount accrued; or (2) as a series of fixed monthly payments for a fixed number of years; or (3) as a life annuity, that is, a series of fixed monthly payments for the balance of the retired employee's life. No distinction was drawn between men and women who on retirement chose options (1) or (2): equal contributions yielded equal payments. But under option (3) (the life annuity) women received lower monthly payments than men who had made the same contributions. The lower payments reflected, of course, the fact that women on average live longer than men and would therefore on average draw their payments for a longer period of time. The Court recognized that the actuarial value at the time of retirement of the woman's annuity would be exactly the same as the value of the man's annuity: "the lower value of each monthly payment she is promised is offset by the likelihood that she will live longer and therefore receive more payments". Nonetheless, the Court, by a majority of five to four, followed the earlier Manhart case to hold that the difference in the monthly payments violated Title VII of the Civil Rights Act of 1964: "the classification of employees on the basis of sex is no more permissible at the pay-out stage of a retirement plan than at the pay-in stage". Despite the undisputed correlation between sex and life expectancy, the use of a sex-based classification to predict longevity was proscribed. Despite the undisputed greater costs of providing equal monthly payments to women, equal monthly payments had to be provided (or the annuity option abandoned - the course in fact followed by the state after the lower court decisions).

Not too much should be read into the Manhart and Arizona cases. They held only that classification by sex was proscribed

by Title VII of the Civil Rights Act of 1964, a statute prohibiting discrimination in employment. As O'Connor J. pointed out in her separate concurring opinion in Arizona, neither case addressed "the larger issue of whether considerations of sex should be barred from all insurance plans, including individual purchases of insurance [i.e. purchases outside employment]". As both Marshall (for the plurality) and O'Connor JJ. pointed out in Arizona, neither case addressed the constitutional issue of whether sex-based classifications in state pension plans violated the equal protection clause of the fourteenth amendment. Interestingly, the District Court Judge in the Arizona case at first instance did address the constitutional issue and held that the Arizona plan did not violate equal protection, although the Judge held that the plan did violate Title VII: (1980) 486 F. Supp. 645, 651. The constitutional ruling was not appealed and was therefore not considered by either the Court of Appeals for the Ninth Circuit or the Supreme Court of the United States.

But when all this is said, it is plain that sex-based classifications are becoming increasingly difficult to sustain in the face of legal challenge - upon whatever legal ground. What makes Manhart and Arizona so disturbing from the point of view of the insurance industry is the Court's rejection of sex-based classification in a context (the prediction of mortality) where the relevance of sex cannot be (and was not) disputed, and where the classification was not based on an archaic stereotype about the role of women in society.

The American Court seems to be moving to a position where it will come to treat sexual classifications as similarly objectionable to racial classifications. In Manhart Stevens J. for the majority (at p. 709) pointed out that the life expectancy of black Americans was six years shorter than that of white Americans (65.9 years versus 72.2 in 1973); yet the use of race-based longevity tables would clearly offend Title VII. This example is a telling one, because I think it would be widely accepted in the United States (as well as in Canada) that the public policy in favour of a race-neutral society is so powerful that it simply has to override virtually all other considerations, even to the point of compelling actuarially unsound insurance practices. The "raising of consciousness" in the matter of sex which has been so successfully achieved by women's groups is gradually establishing a similarly powerful public policy in favour of a sex-neutral society. This is gradually being reflected in the policies of all branches of government, including the courts, in the United States.

Canadian speculations

In Canada the movement in favour of equal rights for women has led to the inclusion in the Charter of s.28 (which is quite similar to the now-lapsed proposed equal rights amendment in the United States), and to the exclusion of s.28 from the override power of s.33. It will be recalled that s.28 was not in the original (October 1980) version of the Charter, and after it was included it was initially made subject to override under s.33. These important

constitutional victories were gained by women's groups during the negotiation of the constitutional settlement of 1982. Those same groups, along with other civil liberties groups and many individuals, will be vigilant on all fronts, including litigation, to solidify these constitutional gains. The dynamics of the situation are not changed all that much where the alleged discrimination is in favour of women rather than men (as in the case of automobile insurance premiums). Discrimination against men will be fought just as hard as discrimination against women by those who believe in a sex-neutral society, the reasoning being that in the long run women will gain more overall than they will lose. (See Wendy W. Williams, "Sex Discrimination under the Charter" (1983) 4 Can. Human Rights Reporter 1, 4; and note that the raising of the standard of judicial review in the United States has occurred in cases involving discrimination against men, namely, Craig v. Boren, discussed p. 37, above, and Mississippi University for Women v. Hogan, discussed p. 38, above.)

In a legal opinion I do not usually embark on flights of sociology or politics, as I suppose the previous paragraph could be characterized. But it is idle to ignore developments in Canada's political culture which I believe cannot fail to influence the Supreme Court of Canada, just as they have obviously influenced the Supreme Court of the United States. The Supreme Court of Canada has not yet decided any Charter cases, although it has already granted leave to appeal in eleven cases (none of them germane to our present problem). I believe that the Supreme Court of Canada will be anxious to allay the

oft-repeated fear that it is going to "water down" the Charter, and that it will be anxious not to disappoint the expectations of minorities and women which were generated during the constitutional debates in 1980-82. The two decisions under the statutory Canadian Bill of Rights which arguably tolerated sex-based discrimination, namely, A.-G. Can. v. Lavell [1974] S.C.R. 1349 (Indian women denied Indian status if married to non-Indian) and Bliss v. A.-G. Can. [1979] 1 S.C.R. 183 (pregnant women denied unemployment insurance benefits), received virtually universal criticism, and the Court will I believe wish to start afresh, armed as it now is with the stronger language and entrenched status of the Charter: see Tarnopolsky and Beaudoin, The Canadian Charter of Rights and Freedoms: Commentary (1982), 421-423; Gold, "A Principled Approach to Equality Rights" (1982) 4 Supreme Court L.R. 131, 135-145.

Conclusion

One view is that ss.15 and 28 of the Charter absolutely prohibit all sexual classifications: pp.31-32, above. If that is correct, the use of sex as a rating factor for automobile insurance will (after s.15 comes into force on April 17, 1985) contravene the Charter.

The preferable view is that ss.15 and 28 would admit at least affirmative action programmes in favour of women (which are expressly referred to in s.15(2)) and are therefore not an absolute prohibition on sexual classifications: pp. 32-34, above. However,


the absolute language of s.28, the increasingly strict approach of the American courts, and the climate of opinion in favour of sexual neutrality, all combine to suggest that the Supreme Court of Canada will be very reluctant to sanction a sexual classification. While the insurance industry can undoubtedly establish that young men have more automobile accidents than young women, there is more room to dispute the use of sex than there is with respect to age. As soon as one starts to speculate on the likely reasons for greater male accidents, they tend to suggest stereotypical sex roles in which the young male is more dominant and aggressive (more often the driver) and more reckless than the young female. The industry can say, of course, that for whatever reasons sex is in fact correlated to risk, and therefore should be used as a factor in setting premiums. But I believe that it is likely that the Court would find this reasoning to be at least suggestive of stereotypical sex-roles and as not sufficiently compelling to overcome the heavy burden of justifying a sexual distinction in the face of s.28 of the Charter.

I regret that so much of this section of the opinion is necessarily speculative (and therefore may be proved wrong), but in my opinion the use of sex as a rating factor for automobile insurance will (after s.15 comes into force on April 17, 1985) probably contravene the Charter.

Conclusions

Omitting the qualifications and complications which I hope are sufficiently explained in the body of this opinion, my opinion may be summarized as follows. After April 17, 1985, when s.15 of the Charter comes into force:

1. The use of age as a rating factor for automobile insurance will not contravene the Charter.
2. The use of marital status will probably not contravene the Charter.
3. The use of sex will contravene the Charter.
4. In provinces where rates are set by private insurance companies, and are not subject to any form of government approval, the Charter does not apply to those rates at all: even sex can be used as a rating factor for those rates in those provinces.



PETER W. HOGG

APPENDIX XIII

AGENCY CONTRACT

This contract replaces all contracts previously made

Dated 19

1. The appointment of
(Hereinafter called the Agency)

Address

City or Town

as Agent of
(Hereinafter called the Company)

is hereby accepted and confirmed with authority, subject to the Company's underwriting instructions, (1) to sign and deliver such Policies and Renewal Certificates of the Company as are supplied to the Agency and (2) to bind the Company by issue of such "Cover Notes" and/or "Certificates" of the Company and/or "Policies" as may be designated for use by the Agency, subject to the following conditions:

2. The Agency is required to report to the Company without delay all commitments made on its behalf and to conform to and promptly comply with such underwriting or other instructions as are issued.

3. The Agency is authorized to receive the premiums due to the Company in respect to the above and all monies so received shall be securely and honestly held by it as fiduciary trust funds and shall be used by it for no personal or other purpose whatever. The Agency agrees to pay the Company all premiums accruing on insurance written in the Company whether collected by the Agency or otherwise.

4. The Agency's remuneration shall be as defined by the schedule of commissions hereon, and such schedule shall govern upon the net cash premiums of the insurances paid by agent to the Company. In the case of cancellation of policies the commission on rebates must be the same as the commission allowed upon the premiums of the policy, and shall be borne by the Agency herein, whether the cancellation is effected prior or subsequent to the termination of this agreement.

5. All monies due by the Agency to the Company in each month, less its commission, shall be paid by it to the Company within 60 days from the end of the month in which the business is written. Subsequent credits to be included in the following month's account.

6. Payments made by the Agency to the Company in respect of any premiums or portions thereof, which have not been paid to the Agency by the Insured, shall be considered only as deposits made by the Agency with the Company to secure the Company against loss of earned premiums and neither as actual payments of said premiums by or on behalf of the Insured nor as premium or premiums actually paid by the Insured.

7. This Agreement may be terminated by written notice at the pleasure of either party when all monies owing or to become owing by the Agency to the Company shall immediately become payable and any liability for these monies shall not be discharged until these are paid by the Agency to the Company. The Agency will forthwith return to the Company all its documents and supplies then in the Agency's possession, but retaining those supplies which have become a record of business in force, and such records shall be deemed to be the property of the Agency.

8. Upon termination of this agreement, the Company will hold inviolate the records of the risks produced through this Agency as the asset of the Agency and not of the Company, and will neither interfere with the current risks or renewals of same nor divulge to any other interest any information pertaining thereto, except only (a) in case the Agency is in default in account with the Company, when the Company reserves the right to deal with this subject as it may then see fit, and (b) the subsequent premiums due upon non-cancellable Policies or Bonds may, at the discretion of the Company, be collected direct and the commission paid or credited to the account of the generating Agency.

9. It is expressly understood and agreed that the word "Agent" wherever used in this Agreement shall include and be binding upon the heirs, executors, administrators, successors and assigns of the Agent as the case may be, and that, in the case where the Agent is a partnership or corporation, the person or persons who have signed these presents on behalf of the partnership or corporation are personally, jointly and severally responsible between themselves and with the agent for all the obligations of the agent under these presents without the privileges of discussion and division.

Executed on behalf of the Agency by

..... Executed on behalf of the Company by:

..... *Authorized Officers*

(Signatures of all Authorized Officers of the Agency)

ANNUAL PREMIUM QUOTATIONS FOR EACH EXAMPLE

Each table shows the cost of one year of car insurance for sixteen different insurance companies. The twelve largest car insurers are listed in alphabetical order in the first part of each table.

The second part of each table shows four additional insurers whose rates are among the lowest for that example. If one of the top twelve insurers also has one of the lowest rates, its rates are not repeated under the lowest quotes heading.



Example 1

Coverages and Limits

BI/PD 20/40/10 or 50 CSL

PPI \$1,000,000

PIP Med. & work loss excess, \$300 ded. each

UM 20/40 COLL Broad, \$100 ded.

COMPREHENSIVE \$50 ded.

Car

1980 Ford Fiesta

Driver

Principal, age 20, Licensed 3 yrs.

Single—no dependents, 4 mi. one-way commute

5,000 mi./yr., No tickets/accidents



Example 2

Coverages and Limits

BI/PD 20/40/10 or 50 CSL

PPI \$1,000,000

PIP Med. & work loss excess, \$300 ded. each

UM 20/40 COLL Broad, \$100 ded.

COMPREHENSIVE \$50 ded.

Cars

Car 1—Wife—1981 Chevy Citation

Car 2—Husband—1984 Olds Cutlass Ciera

Drivers

Parents, age 35, both principal drivers

Wife: 1 mi. commute one way

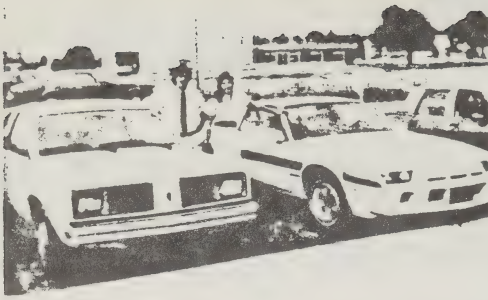
2000 mi./yr.

Husband: 12 mi. commute one way

10,000 mi./yr.

Both drivers have no tickets/accidents

Two children



Example 3

Coverages and Limits

BI/PD 20/40/10 or 50 CSL

PPI \$1,000,000

PIP Med. & work loss excess, \$300 ded. each

UM 20/40 COLL Broad, \$100 ded.

COMPREHENSIVE \$50 ded.

Cars

Car 1—Wife—1983 Chevrolet Camaro

Car 2—Husband—1981 Olds Omega 2 dr.

Drivers

Married couple—age 27

Wife: 3 mi. one way commute, 7000 mi./yr.

No tickets/accidents

Husband: 5 mi. commute one way, 11,000 mi./yr.

Five (5) eligibility points

2 pt. ticket + 3 pt. accident

No children



Example 4

Coverages and Limits

BI/PD 20/40/10 or 50 CSL

PPI \$1,000,000

PIP Med. & work loss primary, no ded.

UM 20/40 COLL Broad, \$100 ded.

COMPREHENSIVE \$50 ded.

Car







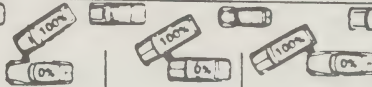
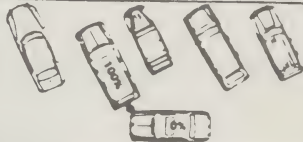











1975 Chevrolet Impala 4 dr. Sedan

Drivers

Retired couple, age 66

Pleasure use No tickets/accidents

No earned income/No dependents 2,500 mi./yr.

Situations		A		B										
1	Vehicles in the same lane and direction, one vehicle struck from behind. See Special Note #1													
2	Vehicles in adjacent lanes, same or opposite direction, both vehicles on or over centre-line or where point of impact cannot be determined. See Special Note #2													
3	Vehicles in adjacent lanes, same direction with one vehicle changing lanes, or opposite direction with one vehicle over centre line. See Special Note #2													
4	Vehicle pulling out from a parked position as another passes.													
5	(I) EXCEPT ONTARIO One vehicle turning left while being overtaken (A) at intersection, 0/100 in favour of left turning vehicle (B) at any driveway, 75/25 in favour of overtaking vehicle													
	(II) IN ONTARIO ONLY One vehicle turning left at intersection or at any driveway as other vehicle overtaking to pass shall be 75/25 in favour of overtaking vehicle See Special Note #5													
6	Intersection — vehicles in opposite directions, one vehicle turning left. Applicable in all situations except those described in Notes (a) or (g).													
7	A — EXCEPT ONTARIO Intersection — no traffic lights, vehicles proceeding at right angles, vehicle on right has right of way — 0/100 in favour of vehicle on right.													
	B — IN ONTARIO ONLY Intersection — no traffic lights, vehicles proceeding at right angles, vehicle on right has right of way — 75/25 in favour of vehicle on right.													
8	Where an accident occurs at an intersection equipped with STOP signs on each corner, the right of way applies unless it is proven: (a) that B failed to stop (B to be held fully liable) or (b) that both A & B failed to stop (both to be held equally liable)	<table><tr><td></td><td>A</td><td>B</td></tr><tr><td>a)</td><td>0%</td><td>100%</td></tr><tr><td>b)</td><td>50%</td><td>50%</td></tr></table>			A	B	a)	0%	100%	b)	50%	50%		
	A	B												
a)	0%	100%												
b)	50%	50%												

APPENDIX XVI

A DRAFT FOR CONSULTATION: A CLASSIFICATION
SYSTEM FOR AUTOMOBILE INSURANCE

AVANT-PROJET AUX FINS DE CONSULTATION:
LE SYSTÈME DE CLASSIFICATION POUR
L'ASSURANCE-AUTOMOBILE

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TO ALL INTERESTED PERSONS

A Classification System for Automobile Insurance: A Draft for Consultation is being circulated with the intention of soliciting comments and suggestions for the proposed regulation. The Ministry recognizes that initiatives related to automobile insurance are of significance to the public at large, and that it is important to take the opportunity to gain the views and suggestions of those who will be directly affected. It is for this reason that the Consultation Draft is being made available for scrutiny and response.

The Ministry of Financial Institutions looks forward to receiving comments and suggested changes.

Those who wish to respond to the Consultation Draft are urged to do so before the deadline of March 31, 1988. Please address comments in writing to:

Robert F. Nixon,
Minister of Financial Institutions,
Consultation Draft,
Ministry of Financial Institutions,
555 Yonge Street, 8th Floor
Toronto, Ontario,
M7A 2H6.

Additional copies of the Consultation Draft may be purchased from the Ontario Government Bookstore, 880 Bay Street, Toronto, Ontario, M7A 1N8.

February, 1988

INTRODUCTION TO AUTOMOBILE INSURANCE CLASSIFICATION

Automobile insurance is the undertaking by a licensed insurance company to indemnify certain persons against loss or liability for loss connected with an incident involving a motor vehicle. Those indemnified could include the vehicle owner or driver or those injured or suffering loss as a result of an accident. Ontario law regarding automobile insurance requires that a minimum level of insurance be obtained for every motor vehicle. In addition, vehicle owners desire the protection offered by insurance and purchase types or levels of insurance beyond that mandated by law. There are over five million insured vehicles in Ontario, so a system to determine the relative risk that each vehicle represents to the overall insurance pool becomes essential.

The price charged by insurance companies for assuming the risk of indemnification is usually referred to as the automobile insurance premium. In assessing the appropriateness of a specific premium, the risks associated with that vehicle are analysed. In deciding what actual premiums should be charged, insurance companies try to predict the future - to assess the likelihood that a vehicle will be involved in an accident. The elements of this assessment, the basis on which likelihood is evaluated, are termed risk factors. Many risk factors relate to the characteristics of the vehicle itself; many others relate to the characteristics of the drivers using the vehicle or the type of activity the vehicle is used for. A system which categorizes insurance related risk factors for groups of drivers or vehicles is a classification system; in essence, individuals are classified in response to the exposure to claims they represent for the entire insurance pool.

Classification of risk underlies the determination of insurance premiums. The actual systems used to classify risk have differed from insurance company to insurance company. However, all insurance companies have been required to report premiums and losses in the same way based on an approved "Superintendent's Statistical Plan". Many, but certainly not all classification practices in companies have been similar to that set out under this Statistical Plan. As part of a number of automobile insurance related reforms, the Minister of Financial Institutions announced on April 23, 1987 that a uniform mandatory classification system would be introduced in Ontario. It was proposed that such a uniform system be set out by regulation and that it eliminate rating by age, sex or marital status. This regulation-making capacity has been provided for in the Ontario Automobile Insurance Board Act, 1987 (Bill 2).

The discussion that follows is an outline of the concepts underlying the draft uniform automobile classification regulation, intended as a starting point for discussion of this complex matter. It is important to note that when a final position is developed and a regulation comes into effect, it is anticipated that this regulation will evolve over time and be revised regularly. To serve the public, the classification system must change to respond to public needs and market conditions.

The draft regulation was developed with many goals in mind, goals for the overall system of automobile insurance risk classification and goals for the individual risk classification criteria.

In designing the overall classification system, it was felt that the system should:

- provide reasonable flexibility in response to the differing situations of insureds;
- increase informed consumer choice;
- be understandable to consumers, insurance brokers and insurance companies;
- not create artificial distinctions between groups of insureds;
- be consistent in applying rules across the system;
- be capable of implementation without unnecessary dislocation; and
- be based on risk factors which are independent of each other so that the relationship between risk factors and the likelihood of having an accident can be effectively measured.

To meet these goals for the classification system, it was often necessary to weigh conflicting goals to reach an appropriate balance. For example, the desire to be flexible, increase choice and avoid unnecessary dislocation may increase complexity and be in conflict with the goal of having a system which is readily understandable. Further discussion and consultation is essential to ensure the balance between goals is struck at the optimum point.

In judging what should be the individual risk factors incorporated into the overall classification system, each potential risk factor was considered and the following key questions asked:

- Is the risk factor socially acceptable? Does it incorporate, for example, elements of discrimination that are not acceptable?
- Is the risk factor clear and not ambiguous? Can people clearly determine what risk factors are applicable to them?
- Is there a plausible relationship between the risk factor and the likelihood of future claims? In other words, is the risk factor predictive of future claims or lack of future claims?
- Is the risk factor practical in that it is administratively feasible to use; is it verifiable, understandable and easily measured? As well, is the risk factor sufficiently widespread that there would be an adequate number in the group identified by the risk factor? If not, the group would lack statistical credibility.
- Are those assigned to the risk factor group homogeneous or sufficiently similar to make it likely that their experience would be similar for automobile rating purposes? If not, the premium within the group would be unfairly distributed.
- Does the risk factor create an incentive for certain desirable driving behaviours?
- Does the risk factor have the potential to be artificially manipulated in a way that distorts the overall rating system?

It was this series of questions which led to the weighing of the myriad potential factors and the choice of those factors proposed in the classification regulation. Public review of these factors is essential to ensure that those chosen best serve the public.

THE AUTOMOBILE INSURANCE CLASSIFICATION SYSTEM AND THE RATE DETERMINATION PROCESS

The classification system for automobile insurance is provided for by the Ontario Automobile Insurance Board Act, 1987 (Bill 2). That Bill is divided into three parts:

Part I, which establishes the Ontario Automobile Insurance Board and provides for its powers and duties;

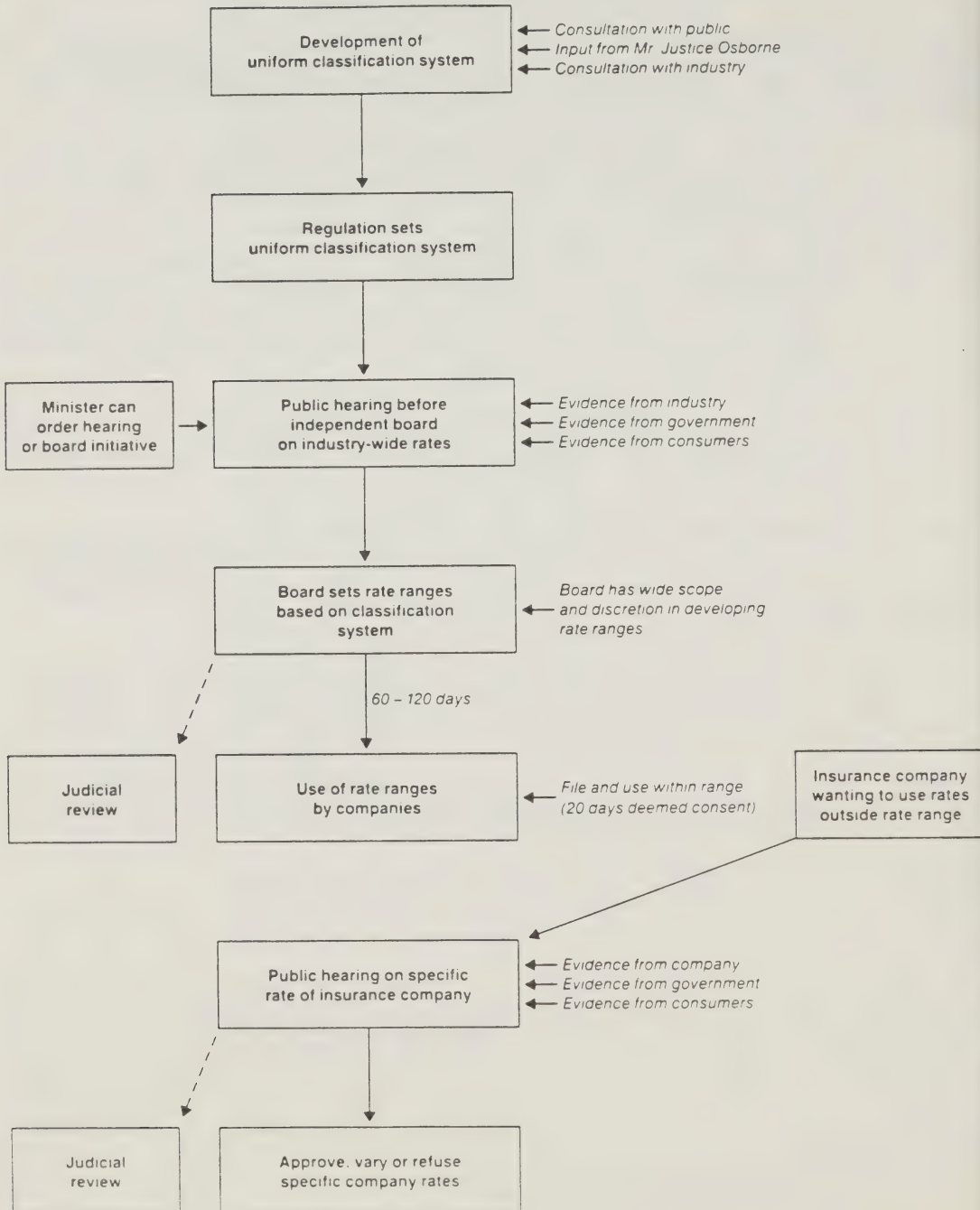
Part II, which provides for the setting by regulation of a mandatory uniform classification system for automobile insurance risks and provides for the process of determining rates to be charged by insurance companies;

Part III, which provides for the enforcement of the Act, regulations and incidental amendments to other statutes.

The flow chart on the following page outlines the process by which rates under a uniform classification system prescribed by regulation will be determined by the Ontario Automobile Insurance Board.

In brief, the Act provides that following a public hearing, the Board will set ranges of rates, using the uniform classification system as the basis for this benchmark setting exercise. Companies wishing to use rates within the range may do so by filing their specific rates, with no hearing requirement. Companies wishing to use rates outside the rate range must apply for Board approval and a public hearing will be held.

Flow Chart - Ontario Automobile Insurance Board



OVERVIEW OF THE PROPOSED CLASSIFICATION SYSTEM FOR AUTOMOBILE INSURANCE

Categories of Automobile Insurance Risk

The proposed classification system is divided into three general categories of automobile insurance risk, with some subcategories:

I. Personal Vehicles

- a) Private Passenger Vehicles
- b) Motorcycles
- c) Miscellaneous Personal Vehicles
 - i) Trailers and Camper Units
 - ii) Off Road Vehicles
 - iii) Antique or Historic Vehicles
 - iv) Snow Vehicles

II. Commercial Vehicles

- a) Commercial Vehicles, excluding Interurban Vehicles
- b) Interurban Vehicles

III. Public Vehicles

- a) Taxis and Limousines
- b) Buses, Ambulances and Funeral Vehicles
- c) Long Distance Buses

These categories were chosen because they follow, to a large degree, existing wide distinctions made among types of potential insurance risks. In preparing the proposed classification regulation, the Ministry retained an independent consulting actuarial firm in order to determine current classification practices in use. This study has been useful in assessing the degree of dislocation that will occur as a result of the implementation of a new uniform classification system.

In the personal automobile area, it was found that there was a wide divergence among insurance companies in the classification systems used. In the commercial area, on the other hand, there was a large degree of uniformity in classification practices, much of which has been brought forward into the current proposal. In the public automobile area, where people are carried for hire or in large numbers, there were variations in industry practice in certain areas, while other areas were characterized by a large degree of uniformity among insurance companies.

Individual Risk Factors

Within the general categories and subcategories of insurance used in the proposed classification system there are a number of individual risk factors which are employed in the design of the overall classification system. The risk factors used can generally be characterized as falling into three main groups:

- vehicle use;
- vehicle characteristics; and
- driver characteristics.

Under vehicle use, for example, there are factors relating to distance driven, territory where the vehicle is used, and type of activity the vehicle is used for.

Under vehicle characteristics, for example, there are factors relating to engine size, style or type of vehicle, age of the vehicle and price or value of the vehicle.

Under driver characteristics, for example, there are factors relating to years of driving experience, conviction and at-fault accident experience and whether the driver is an abstainer.

The risk groups are outlined in considerable detail in the chart which follows, starting on page 862.

Scope of the Classification System

The Classification System covers "automobile insurance" which is defined in the Automobile Insurance Board Act, 1987 (Bill 2). In simple terms, this definition covers all vehicles which require a permit under the Highway Traffic Act. The vast majority of vehicles are within this group. The system also covers snow vehicles under the Motorized Snow Vehicles Act.

The proposed classification system covers the "SPF #1" owner's policy, the common contract purchased by owners for their vehicles. This policy is the standard automobile policy stipulated under the Insurance Act. The classification system would also address the "SPF #2" policy, which is called the "driver's policy". The system does not cover certain policies such as garage (SPF #4), non-owned (SPF #6) and contingent (SPF #8). These risks are less common and are often assessed on a case-by-case

experience basis. This makes them inappropriate for inclusion in a classification system designed to categorize a large number of policies.

The part of a policy which exceeds \$1 million in third party liability coverage is not included in the proposed classification system and it is proposed that these large coverages generally not be subject to the Ontario Automobile Insurance Board, except for Facility Association rates. All Facility Association rates must be approved. Over 98% of private passenger motor vehicle policies have limits of \$1 million or less. Further, pricing of such high limits is frequently dependent on facultative reinsurance which is in essence an individual policy for a particular risk and is individually priced. Policies in excess of \$1 million are therefore not appropriate for the rate range setting approach contemplated for the classification system. There is one exception to the general exclusion of high limits. The Public Vehicles Act requires by regulation certain minimum insurance coverages for public vehicles. Depending on the seating capacity of the vehicle that minimum required may exceed \$1 million. In such a case, where a limit exceeding \$1 million is required by Ontario law, the classification system and Automobile Insurance Board will cover these higher limits.

Fleet rating is also excluded from the proposed classification system and is not subject to the Ontario Automobile Insurance Board. A fleet is defined as a group of five or more powered vehicles under common ownership or management, but the first five private use vehicles may be excluded for the purposes of the definition. There are several reasons for excluding fleet rating:

- fleets are usually rated by the experience of the fleet and factors such as special safety programs carried out by the fleets; to eliminate this would hurt insureds that could benefit from their personal good record or unique safety programs;
- fleets often require higher limits of coverage and facultative reinsurance; and
- many fleet owners are large corporations well able to negotiate with brokers and insurance companies on an equal footing.

It should be noted, in proposing a fleet exclusion, insurance companies may choose to either fleet rate or individually rate vehicles which qualify as a fleet. If a vehicle leaves a fleet, its experience may remain with the fleet for rating purposes.

For collision, comprehensive, specified and all perils coverages of insurance, it is difficult to classify the risk associated with very expensive vehicles, because there are very few of them. As a result, the proposed classification system will not cover the vehicle damage portion of policies for private automobiles having a price when newly purchased of more than \$75,000. In the commercial and public vehicle areas, the threshold proposed is \$250,000.

Standardized Provisions

In the interests of having a more consistent and understandable classification system, certain elements of the classification system are standardized. The standardized areas relate to policy deductibles, policy limits and the territories used for classifying risk.

In some coverages policyholders have the option of purchasing a policy which has certain limits for exposures. For the purpose of this proposed system, the standard limits that can be purchased are:

\$200,000 (the statutory minimum for third party liability insurance)

\$300,000

\$500,000

\$1 million

These limits reflect the current most common limits purchased by insureds. For public vehicles, the amounts available are those set under the Public Vehicles Act.

For some coverages, policyholders also have the option of purchasing a policy which has a deductible which must be paid by the policyholder and not by the insurance company. For the purpose of this proposed system, the standard deductibles that can be purchased are:

\$25

\$50

\$100

\$250

\$500

\$1000

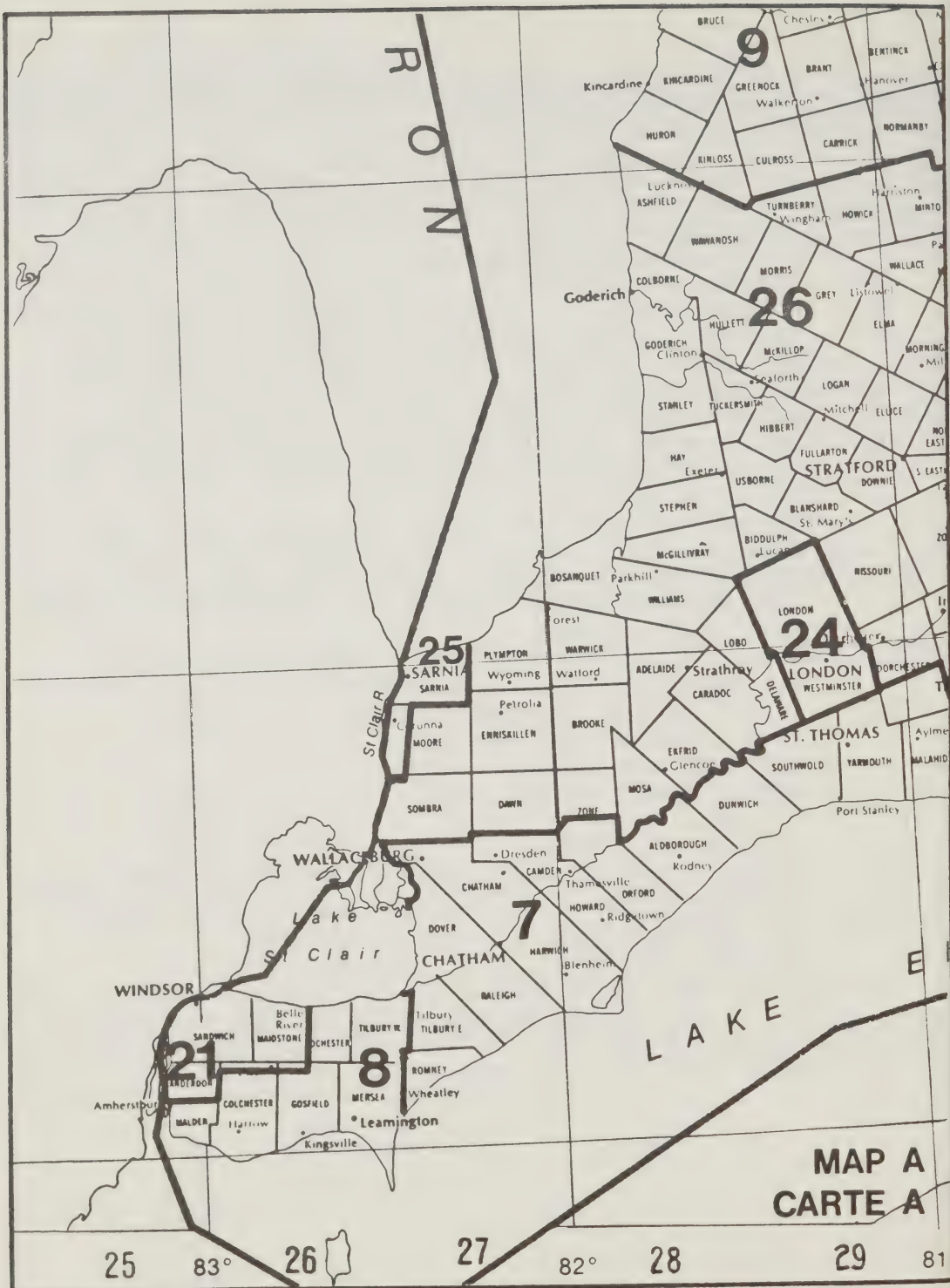
5% of the value of vehicle (list price new), rounded to the nearest \$250

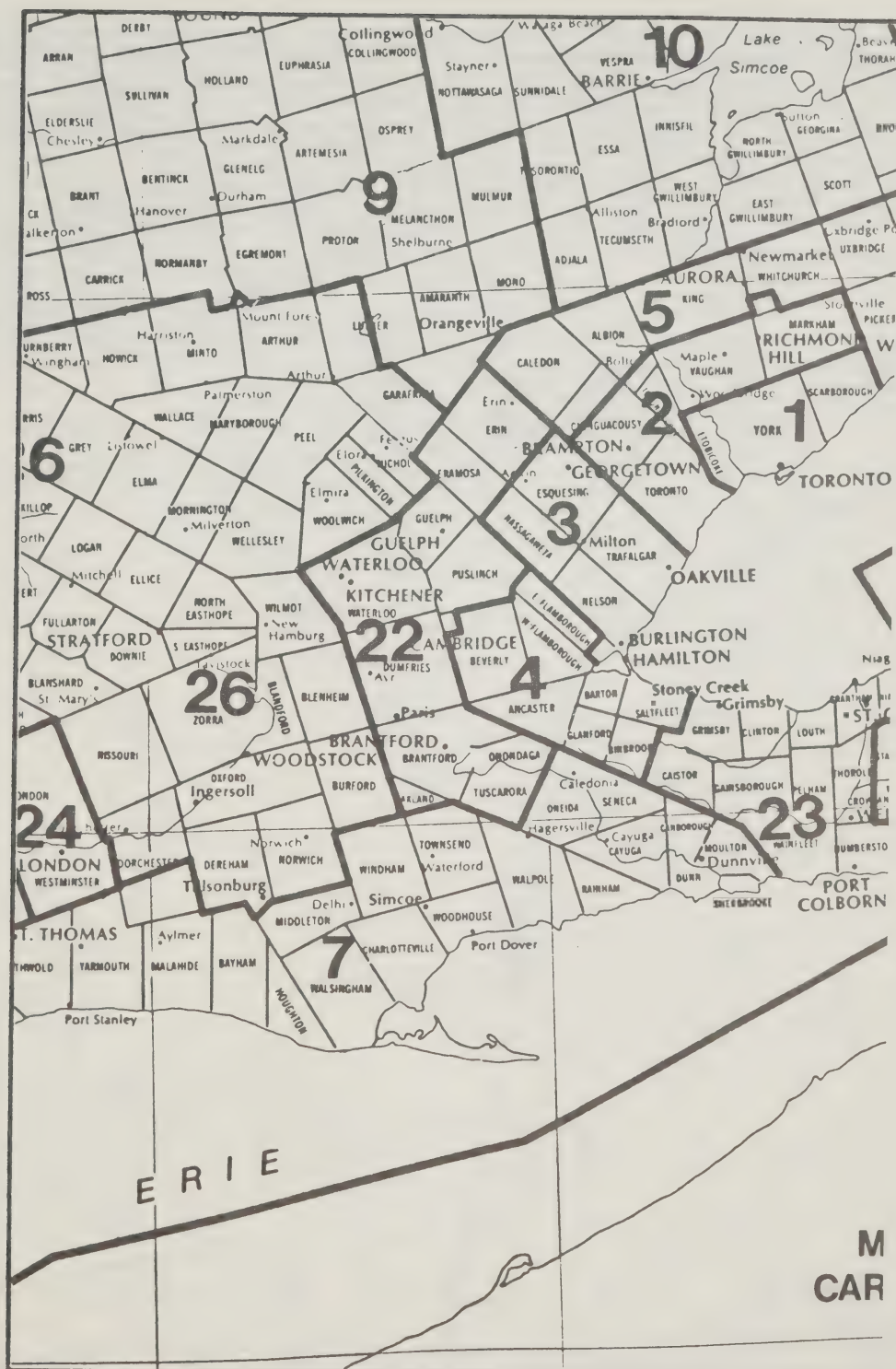
These are the deductibles generally offered at present.

For all elements of the proposed classification system, where territory of residence or use is a factor, 28 standard territories are proposed for use:

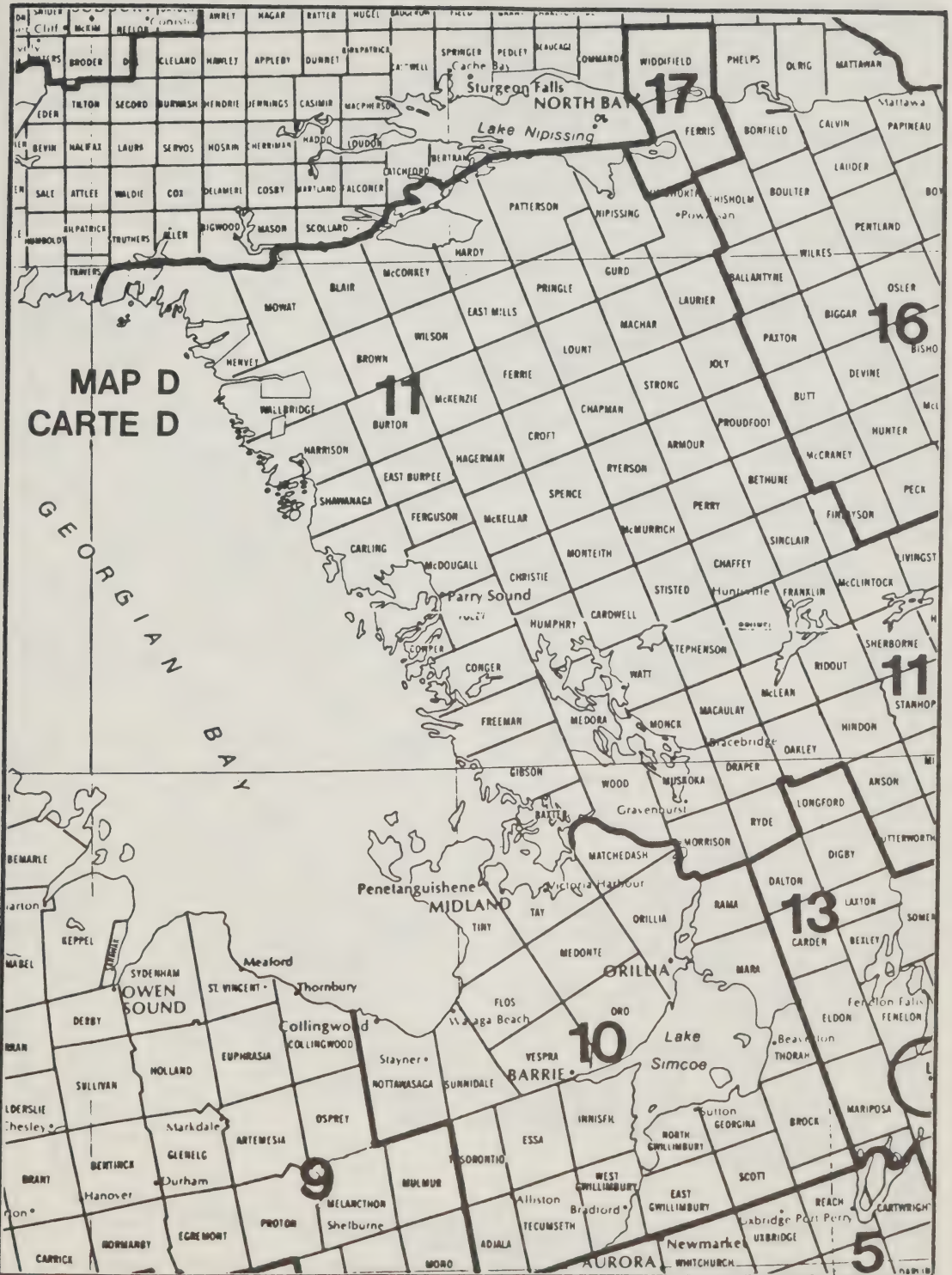
Metropolitan Toronto
Markham, Richmond Hill, Vaughan - Peel Area
Halton Area
Hamilton-Wentworth Area
Niagara Falls Area
Windsor Area
Oshawa, Aurora, Newmarket, Orangeville Area
Brantford, Guelph, Kitchener-Waterloo-Cambridge
Area
St. Catharines-Lincoln Area
Ottawa Area
London Area
Sarnia Area
Lake Erie Area
Essex Area
Stratford, Woodstock, Lake Huron Area
Grey-Bruce Area
Lake Simcoe Area
Parry Sound, Muskoka, Haliburton Area
Peterborough, Lindsay, Port Hope, Cobourg, Trenton
Belleville, Kingston Area
Lake Ontario-Kawartha Lakes Area
Southeastern Counties Area
Lanark-Upper Ottawa Area
Cornwall Area
Sudbury City Area
Northeastern Ontario, Sault Ste. Marie, Manitoulin
Island Area
North Bay Area
Thunder Bay Area
Northwestern Ontario

The maps which follow identify the territories relevant for classification purposes.

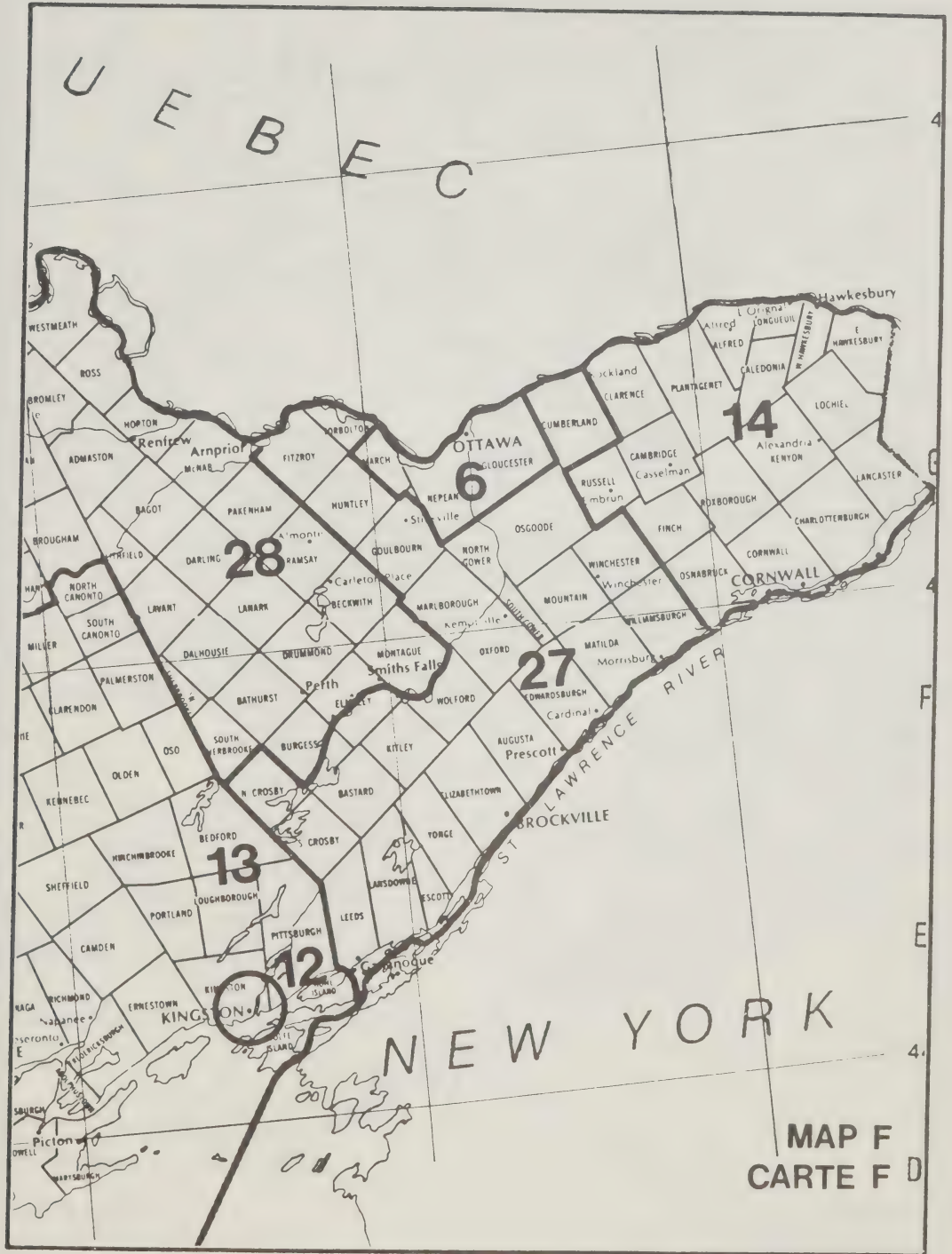


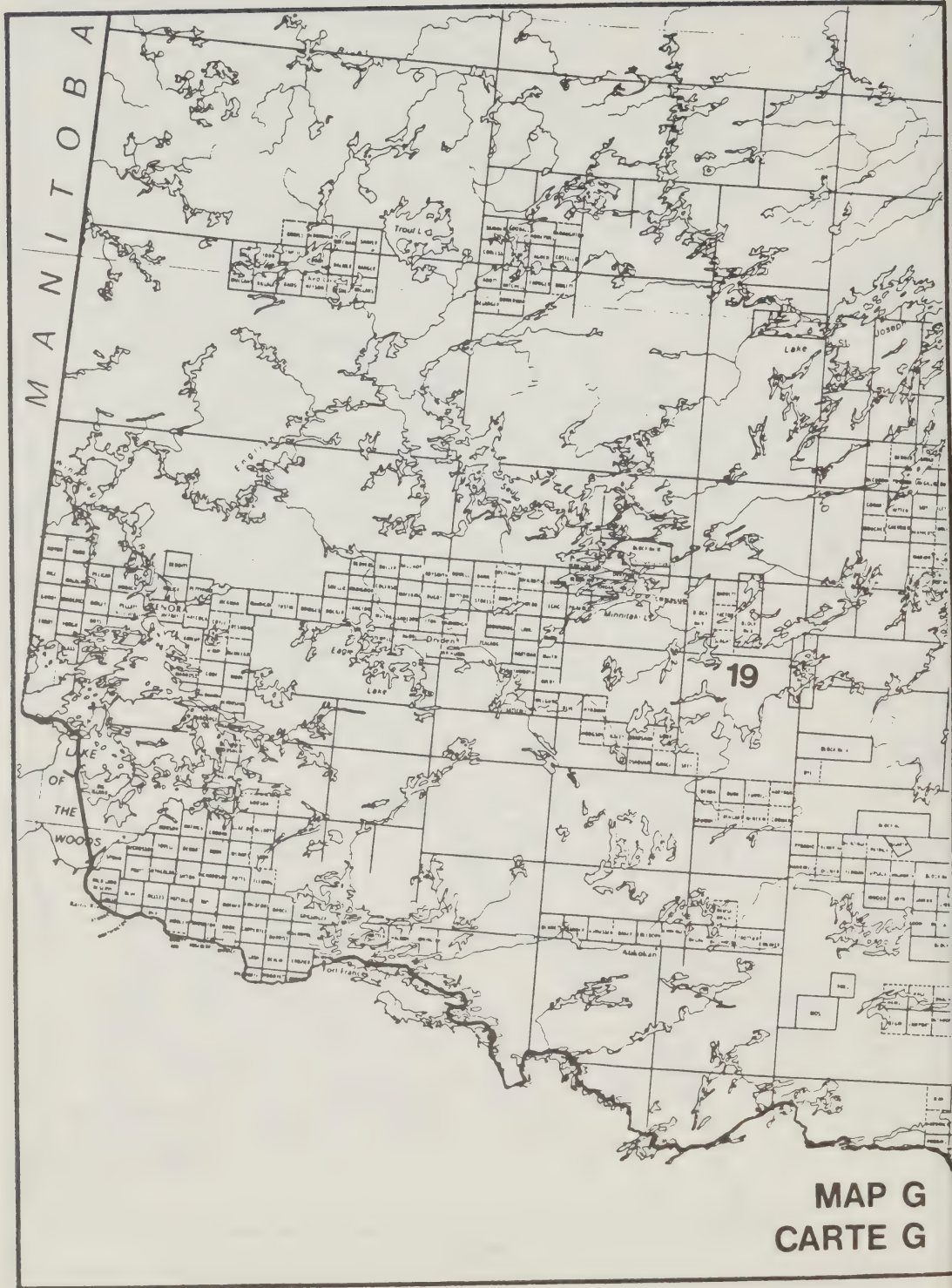


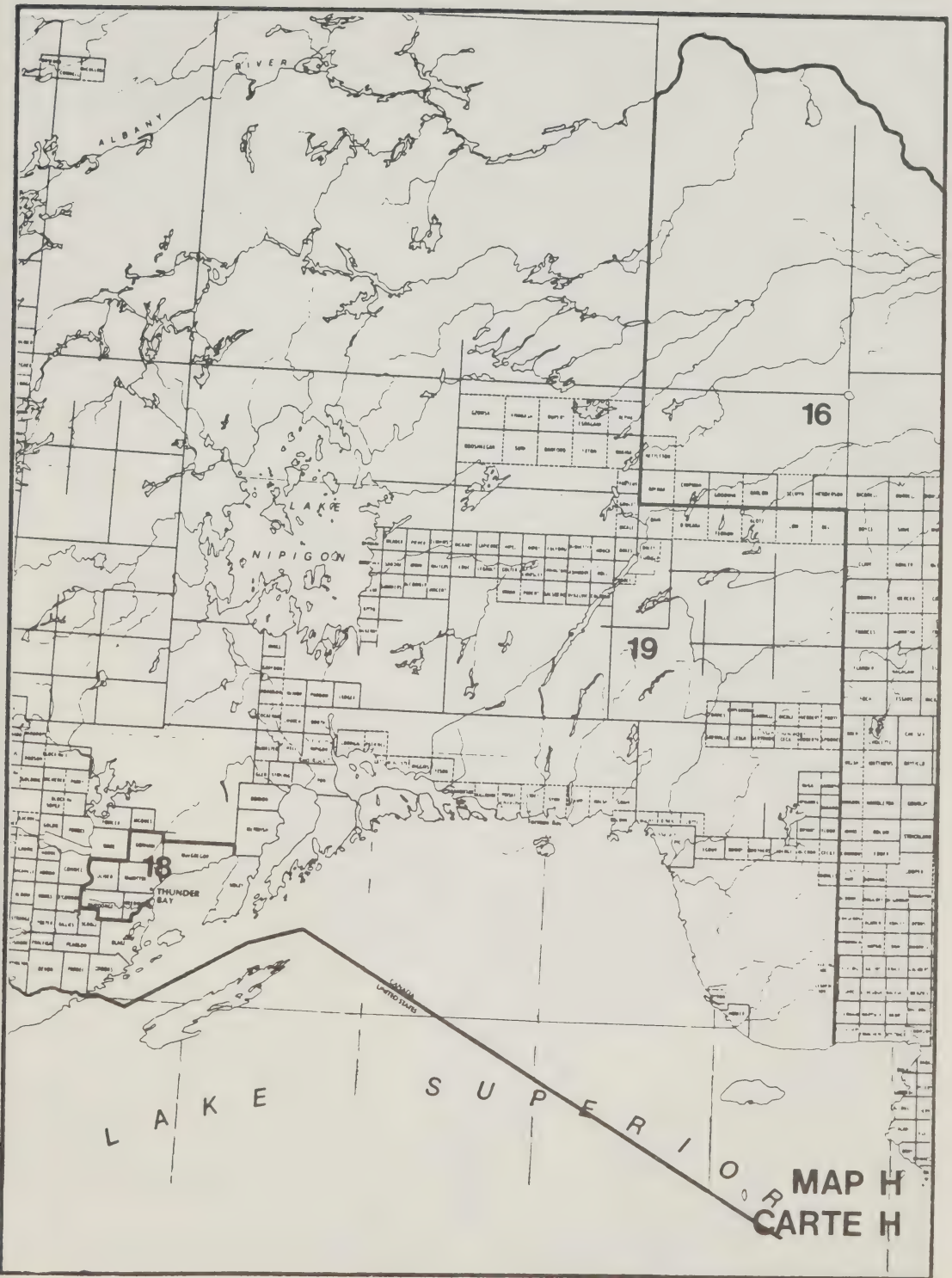
MAP D
CARTE D



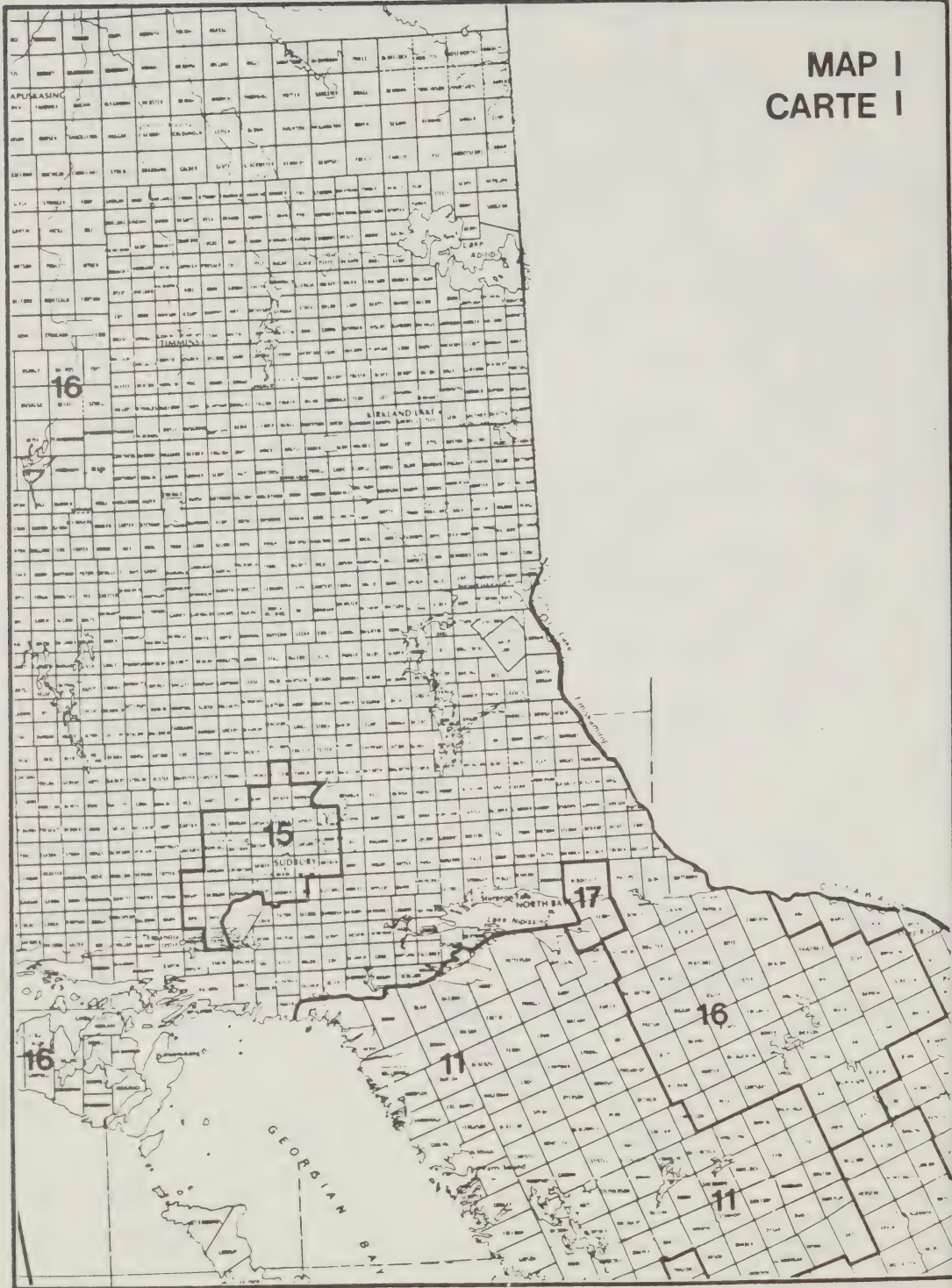


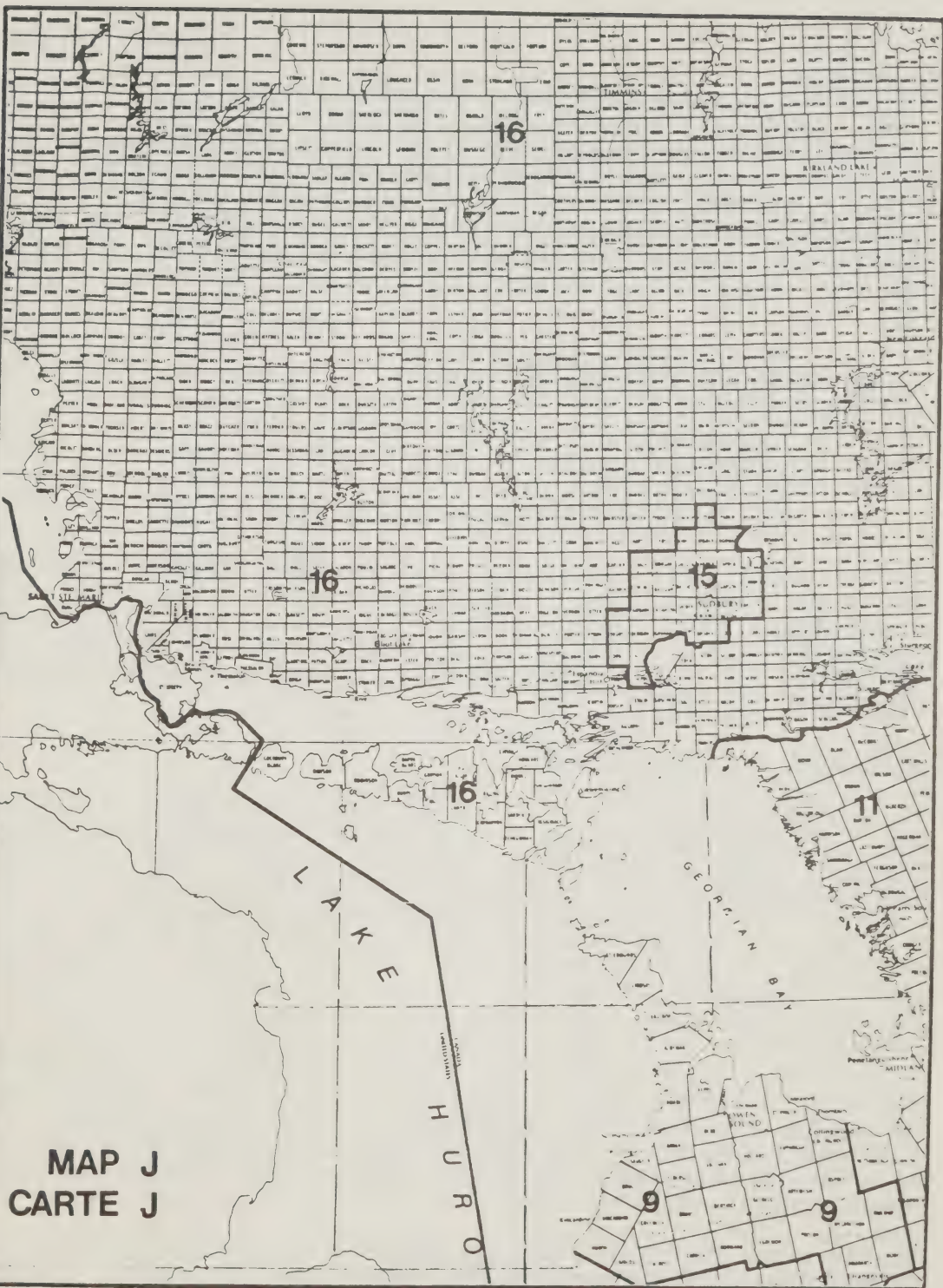






MAP I
CARTE I





Coverages

The classification system outlines the basic categories of insurance risks and defines the risk factors which are relevant to the determination of the hazard presented by a particular insured under certain circumstances. The risk factors are applied to certain types of insurance coverage and may vary from coverage to coverage. These coverages are:

- Third Party Liability
- Accident Benefits
- Collision
- Comprehensive
- Specified Perils
- All Perils
- Family Protection Endorsement (SEF 44)

In the chart that follows on page 862 each general type of insurance risk category (e.g. commercial automobile) is addressed within the context of these seven insurance coverages (e.g. collision). Further, each risk element is identified within the context of its category and related insurance coverage.

Groupings of Risk Factors

As mentioned earlier, other than the standard provisions, the risk factors used in the proposed regulation relate to vehicle use, vehicle characteristics and driver characteristics. The risk factors proposed combine elements currently in widespread use and new approaches. One of the most notable new approaches is to rate insureds on the basis of years of driving experience and to expand the use of annual distance driven as a rating factor for private passenger vehicles. An owner-operator category for taxis is introduced as well as a modified system of accident and conviction recognition for rating purposes. Accident benefits coverage, which has historically been flat-rated, is rated in a manner similar to third party liability coverage because statistical evidence shows that risk varies as with third party liability coverage and these coverages must be purchased together.

In the chart which follows on page 862, the risk factors are allocated to columns entitled: use, years licensed, claims experience or "other". These are highlighted using as the reference point their application to Private Passenger Vehicles, the first category of insurance risk addressed in the chart:

(i) Use

Risk Factors included under this column include the type of activity the vehicle is used for: pleasure; farm; short commute; long commute and/or business and also sets out the annual distance driven in the use of the vehicle. The use of four distance bands reflects an expanded use of distance driven as a rating factor for private passenger vehicles.

(ii) Years Licensed

The years of driving experience is the major element of this column. Six bands are provided for principal drivers and four for secondary drivers, with one band in each of the two groups allocated to drivers with less than three years experience but who have had driver training.

(iii) Claims Experience

This column references the introduction of a modified system of accident and conviction recognition for rating purposes. The approach taken is detailed in the Regulation. In brief, at fault* accidents and convictions over a 3 year period are termed "events". New drivers come into the system on the assumption that they have no "events" (convictions or accidents). If for three years, a driver has no at fault accidents or convictions, he or she becomes a "three year event free" driver. Five years with a clean record results in achieving the best driving class for the "five year event free" driver.

* What is an "at fault" accident is detailed in a Schedule to the Regulation. Essentially, the driver must be at fault to some degree in an accident involving more than \$500 damage. Situations in which he or she is deemed to be at fault or not to be at fault are identified in the Regulation. Examples of no fault accidents include situations where a car was legally parked and struck by a hit and run driver or situations in which a comprehensive damage claim was made, such as for a windshield struck by flying gravel. It is important to note that determinations of fault relate only to the events charging system and do not determine payment of claims or the making of settlements.

One or more events will result in a driver being moved from the "event free" classes to the classes for drivers who have had convictions or accidents. Not all convictions or accidents contribute equally to determining an "event". For example, one Criminal Code conviction such as impaired driving would count as 2 events, whereas two Highway Traffic Act convictions such as failing to yield the right of way would count as one event. As in many aspects of the proposed classification system, the ultimate determination of the appropriate weighting of these various "event" factors will greatly benefit from public consultation.

(iv) Vehicle Characteristics

Risk factors relating to vehicle characteristics apply to Collision, Comprehensive, Specified Perils and All Perils coverages for private passenger vehicles, but are not factors used in rating Third Party Liability or Accident Benefit coverages. Rate group tables are contained in the Regulation, covering vehicle model, age and type. A fallback table based on vehicle value is also used for vehicles not listed within the rate group table.

(v) Other Factors

The column indicates that non-drinking driver reductions are available for private passenger vehicles.

Procedures in Assigning Vehicles and Drivers to Risk Classes

The classification system requires the support of rules which give direction as to which rate factor is applicable in circumstances of doubt or situations where various choices are available. For example, if a vehicle is used both as a private passenger automobile and as a commercial vehicle in the owner's business, how should it be assigned to a risk group? The proposed regulation articulates the various rules applicable to the categories and classification factors. In the case of a mixed use vehicle, for example, the rule provides that a vehicle is assigned to a rating category for which the proportion of use is the highest. The chart which follows references some of the assignment rules which apply; they are more fully articulated in the regulation itself.

The chart which outlines the classification system is comprehensive in that it includes all the factors proposed for the total system. One of the considerations in implementing such a classification system is whether it should be introduced in its entirety or whether portions of it should be phased in over time.

OUTLINE OF ALL AUTOMOBILE CLASSIFICATION
FACTORS BY CATEGORY OF INSURANCE RISK AND TYPE OF INSURANCE COVERAGE

Category of Insurance Risk by Coverage	Territories	Use	Years Licensed	Claims Experience	Vehicle Characteristics	Deductible	Policy Limits	Other Factors, (Specifically Named)
1. Personal Vehicles								
a) Private Passenger Vehicles								
Third Party Liability	X	4 Uses: pleasure, farm, short commute, long commute and/or business -4 distance bands: 35+ under 6500 km, 6500-13,499 km, 13,500-24,499 km, 24,500 km + as above	Principal driver: <3 years experience, <3 with training, 3-6, 7-14, 15-34, convictions and 2 classes Secondary driver: of claims free drivers <3, <3 with training, 3-6 years, 7+ years as above	Surcharge system for "events" - accidents, 3 classes of convictions			X	Non-drinking driver reductions permitted
Accident Benefits	X	as above	as above	as above				as above
Collision	X	as above	as above	as above	rate group tables (model, age, vehicle type) plus price if no rate group	X		as above
Comprehensive	X				as above	X		
Specified Perils	X				as above	X		

OUTLINE OF ALL AUTOMOBILE CLASSIFICATION
FACTORS BY CATEGORY OF INSURANCE RISK AND TYPE OF INSURANCE COVERAGE

Category of Insurance Risk by Coverage	Territories	Use	Years Licensed	Claims Experience	Vehicle Characteristics	Deductible	Policy Limits	Other Factors, (Specifically Named)
All Perils	X	as above	as above	as above	as above	X		
Family Protection Endorsement								
b) Motorcycles							X	flat rated, subject to policy limits
Third Party Liability	X		<2 years licensed for motorcycle, <2 years with driver training, 2+ years	Surcharge system for "events" - accidents 3 classes of convictions, 2 classes of claims free driver	Engine size <100cc, 101-400cc, 401-800cc, 801+cc		X	
Accident Benefits	X		as above	as above	as above			
Collision	X		as above	as above	value of vehicle (assumes SEF 19# endorsement)	X		
Comprehensive					as above	X		
Specified Perils					as above	X		

*SEF 19 endorsement is one in which the insured and insurer agree in advance as to the amount to be paid to the insured in the case of total destruction of the vehicle

OUTLINE OF ALL AUTOMOBILE CLASSIFICATION
FACTORS BY CATEGORY OF INSURANCE RISK AND TYPE OF INSURANCE COVERAGE

Category of Insurance Risk by Coverage	Territories	Use	Years Licensed	Claims Experience	Vehicle Characteristics	Deductible	Policy Limits	Other Factors, (Specifically Named)
All Perils	X		as above	as above	as above	X		
Family Protection Endorsement							X	flat rated, subject to policy limits
c) Miscellaneous Personal Vehicles								
i) Trailers & Camper Units								
Third Party Liability							X	Flat rated, Subject to policy limits
Accident Benefits								flat rated
Collision					price when newly purchased	X		
Comprehensive					as above	X		
Specified Perils					as above	X		
All Perils					as above	X		
Family Protection Endorsement								N/A

OUTLINE OF ALL AUTOMOBILE CLASSIFICATION
FACTORS BY CATEGORY OF INSURANCE RISK AND TYPE OF INSURANCE COVERAGE

Category of Insurance Risk by Coverage	Territories	Use	Years Licensed	Claims Experience	Vehicle Characteristics	Deductible	Policy Limits	Other Factors, (Specifically Named)
11) Off Road Vehicles								
Third Party Liability					engine size - <70cc, 71+cc + and no. of wheels - 2, 3, 4 or more		X	
Accident Benefits					as above and value of vehicle (assumes SEF 19 endorsement)	X		Flat rated
Collision					as above	X		
Comprehensive					as above	X		
Specified Perils					as above	X		
All Perils					as above	X		
Family Protection Endorsement							X	Flat rated, subject to policy limits

**OUTLINE OF ALL AUTOMOBILE CLASSIFICATION
FACTORS BY CATEGORY OF INSURANCE RISK AND TYPE OF INSURANCE COVERAGE**

Category of Insurance Risk by Coverage	Territories	Use	Years Licensed	Claims Experience	Vehicle Characteristics	Deductible	Policy Limits	Other Factors, (Specifically Named)
iii) Antique or Historic Vehicles								
Third Party Liability							X	Flat rated, subject to policy limit
Accident Benefits								Flat rated
Collision					value of vehicle (assumes SEF 19 endorsement)	X		
Comprehensive					as above	X		
Specified Perils					as above	X		as above
All Perils					as above	X		as above
Family Protection Endorsement							X	Flat rated, subject to policy limits

OUTLINE OF ALL AUTOMOBILE CLASSIFICATION
FACTORS BY CATEGORY OF INSURANCE RISK AND TYPE OF INSURANCE COVERAGE

Category of Insurance Risk by Coverage	Territories	Use	Years Licensed	Claims Experience	Vehicle Characteristics	Deductible	Policy Limits	Other Factors, (Specifically Named)
iv) Snow Vehicles								
Third Party Liability							X	Flat rated, subject to policy limit
Accident Benefits								Flat rated
Collision					price when newly purchased	X		
Comprehensive					as above	X		
Specified Perils								
All Perils					as above	X		as above
Family Protection Endorsement					as above	X	X	as above
								Flat rated, subject to policy limits

OUTLINE OF ALL AUTOMOBILE CLASSIFICATION
FACTORS BY CATEGORY OF INSURANCE RISK AND TYPE OF INSURANCE COVERAGE

Category of Insurance Risk by Coverage	Territories	Use	Years Licensed	Claims Experience	Vehicle Characteristics	Deductible	Policy Limits	Other Factors, (Specifically Named)
II. Commercial Vehicles								
a) Commercial Vehicles, Excluding Interurban Vehicles								
Third Party Liability	X	Commercial use rate groups by weight	where driver identified, as in private passenger vehicle otherwise not a factor	where driver identified, as in private passenger vehicles, otherwise claims experience of vehicle (number of claims in last 3 years)			X	U.S. exposures Trailer exposure
Accident Benefits	X	as above	as above	as above				
Collision	as above	as above	as above	as above	price when newly purchased and age and rate groups by weight	X		
Comprehensive	as above	as above			as above	X		

OUTLINE OF ALL AUTOMOBILE CLASSIFICATION
FACTORS BY CATEGORY OF INSURANCE RISK AND TYPE OF INSURANCE COVERAGE

Category of Insurance Risk by Coverage	Territories	Use	Years Licensed	Claims Experience	Vehicle Characteristics	Deductible	Policy Limits	Other Factors, (Specifically Named)
Specified Perils	as above	as above			as above	X		
All Perils	as above	as above	as above	as above	as above	X		
Family Protection Endorsement							X	Flat rated, subject to limits

OUTLINE OF ALL AUTOMOBILE CLASSIFICATION
FACTORS BY CATEGORY OF INSURANCE RISK AND TYPE OF INSURANCE COVERAGE

Category of Insurance Risk by Coverage	Territories	Use	Years Licensed	Claims Experience	Vehicle Characteristics	Deductible	Policy Limits	Other Factors, (Specifically Named)
b) Interurban Vehicles								
Third Party Liability	Distance bands: (from garage) 161-320 km 321-480 km 481-800 km 801-960 km 961+ km	Commercial use rate groups by weight	For identified driver only	If driver identified, as in private passenger vehicle otherwise claims against vehicle for last 3 years and rate groups by weight			X	U.S. exposure by distance bands Trailer exposure
Accident Benefits	as above	as above	as above	as above				as above
Collision	as above	as above	as above	as above	Price of vehicle when newly purchased and age and vehicle rate groups by weight	X		
Comprehensive	as above	as above	as above	as above	as above	X		as above

OUTLINE OF ALL AUTOMOBILE CLASSIFICATION
FACTORS BY CATEGORY OF INSURANCE RISK AND TYPE OF INSURANCE COVERAGE

Category of Insurance Risk by Coverage	Territories	Use	Years Licensed	Claims Experience	Vehicle Characteristics	Deductible	Policy Limits	Other Factors, (Specifically Named)
Specified Perils	as above	as above	as above	as above	as above	X		as above
All Perils	as above	as above	as above	as above	as above	X		as above
Family Protection Endorsement							X	flat rated, subject to limits

OUTLINE OF ALL AUTOMOBILE CLASSIFICATION
FACTORS BY CATEGORY OF INSURANCE RISK AND TYPE OF INSURANCE COVERAGE

Category of Insurance Risk by Coverage	Territories	Use	Years Licensed	Claims Experience	Vehicle Characteristics	Deductible	Policy Limits	Other Factors, (Specifically Named)
III. Public Vehicles								
a) Taxis and Limousines								
Third Party	X	4 categories: owner/operator taxi, airport limousines, other taxis, other limousines	For owner- operator taxi category only, same as private passenger vehicle	For owner- operator category only, same as private passenger vehicles For other categories, number of claims in last 3 years			X	
Accident Benefits	X	as above	as above	as above				
Collision	X	as above	as above	as above	rate groups as in private passenger auto- mobile	X		
Comprehensive	X				as above	X		
Specified Perils	X				as above	X		
All Perils	X	as above	as above	as above	as above	X		
Family Protection Endorsement							X	Flat rated, subject to policy limits

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OUTLINE OF ALL AUTOMOBILE CLASSIFICATION
FACTORS BY CATEGORY OF INSURANCE RISK AND TYPE OF INSURANCE COVERAGE

Category of Insurance Risk by Coverage	Territories	Use	Years Licensed	Claims Experience	Vehicle Characteristics	Deductible	Policy Limits	Other Factors, (Specifically Named)
b) Buses, Ambulances, Funeral Vehicles								
Third Party Liability	X	6 types		claims experience of vehicle (# claims in last 3 years)			subject to Public Vehicles Act	number of seats
Accident Benefits	X	6 types		as above				as above
Collision	X	6 types		as above	price when newly purchased, age of vehicle	X		
Comprehensive	X	6 types			as above	X		
Specified Perils	X	6 types			as above	X		
All Perils	X	6 types		as above	as above	X		
Family Protection Endorsement							as above	Flat rated, subject to policy limits

Note: the 6 types of uses are:
public bus - less 160 km between terminal points
school bus
school and other activities bus
hotel or country club bus
ambulance
funeral vehicle

OUTLINE OF ALL AUTOMOBILE CLASSIFICATION
FACTORS BY CATEGORY OF INSURANCE RISK AND TYPE OF INSURANCE COVERAGE

Category of Insurance Risk by Coverage	Territories	Use	Years Licensed	Claims Experience	Vehicle Characteristics	Deductible	Policy Limits	Other Factors, (Specifically Named)
c) Interurban Buses								
Third Party Liability	160 km + between terminal points,	Public Bus		Number of claims in last 3 years			subject to Public Vehicles Act	Number of seats U.S. exposure
Accident Benefits	as above	as above		as above				as above
Collision	as above	as above		as above	Price when newly purchased plus age	X		as above
Comprehensive	as above	as above		as above	as above	X		as above
Specified Perils	as above	as above		as above	as above	X		as above
All Perils	as above	as above		as above	as above	X		as above
Family Protection Endorsement							as above	

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Structure of the Draft Regulation

The draft regulation setting out the classification system commences with interpretation and application sections. Following these are provisions which identify the use and application of the schedules to the regulation. Procedures for the assignment of vehicles and insureds to various classes of risk exposure are then detailed in the regulation. The regulation is completed by its schedules. The key schedule sets out the framework of the classification system by outlining the categories of automobile insurance and the classes of risk exposure in relation to the coverages of insurance. The schedules following expand on various aspects of this framework.

The regulation-making authority for the proposed regulation comes from the Ontario Automobile Insurance Board Act, 1987 (Bill 2), sections 19 and 29. These sections read:

19. The Lieutenant Governor in Council may prescribe the classes of risk exposures that may be considered in determining the premiums for coverages for different categories of automobile insurance and the procedures to be followed in assigning insureds and vehicles to any such class of risk exposure.
- 29(1) The Lieutenant Governor in Council may make regulations,
- a) prescribing classes of risk exposure and categories of automobile insurance for the purposes of this Act;
 - b) prescribing procedures to be followed in assigning insureds and vehicles to a class of risk exposure; and
 - f) exempting insurers from the requirements of Part II in respect of such categories of automobile insurance, such coverages or such classes of risk exposure as may be set out in the regulations.

The regulation outlining the proposed uniform classification system for automobile insurance follows.

DRAFT CLASSIFICATION SYSTEM REGULATION

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REGULATION MADE UNDER THE
ONTARIO AUTOMOBILE INSURANCE BOARD ACT, 1987

CLASSIFICATION SYSTEM

Interpretation

1. In this Regulation,

"accident and conviction history class" means the applicable class of risk exposure selected from among the classes described in Schedule 3;

"airport limousine" means a limousine that is restricted to transporting passengers to an airport by prearrangement and from an airport;

"bus" means a motor vehicle designed to carry ten or more passengers and used for the transportation of persons, and a motor vehicle designed to carry less than ten passengers that is licensed under the Public Vehicles Act;

"commercial vehicle" means a vehicle that is used in the business of an insured primarily to transport materials, goods, tools or equipment;

"commercial vehicle rating group" means the applicable class of risk exposure selected from among the classes described in Schedule 14;

"commuting" in relation to the use of a personal vehicle means transporting persons regularly from their residence to and from their place of employment or school, or to and from an intermediate place, and includes the use of the vehicle as a carpool vehicle whether or not passengers contribute money toward the cost of commuting;

"dangerous goods" means dangerous goods as defined in the Transportation of Dangerous Goods Act (Canada);

"depreciated vehicle value rating group" means the applicable class of risk exposure selected from among the classes described in Schedule 16;

- "driver training" means the completion of a course of driver education, as evidenced by a certificate, that is taught by a person who is licensed as a driving instructor under the Highway Traffic Act;
- "funeral vehicle" includes a hearse and a limousine that is used in the conduct of funerals;
- "heavy" with respect to a vehicle means a vehicle that weighs more than 4.5 tonnes;
- "historic vehicle" means a vehicle that is licensed as an historic vehicle under the Highway Traffic Act;
- "interurban bus" means a bus that travels between terminal points that are more than 160 kilometres apart;
- "interurban vehicle" means a heavy commercial vehicle with a radius of travel that is greater than 160 kilometres;
- "limousine" means a public vehicle equipped to carry a maximum of six passengers that is restricted to transporting passengers by prearrangement;
- "light" with respect to a vehicle means a vehicle that weighs 4.5 tonnes or less;
- "motorcycle" means a two- or three-wheeled motorized vehicle that is licensed for highway use;
- "motorcycle driver training" means driver training in the use of a motorcycle;
- "non-drinker" in relation to a driver means a person who has agreed not to consume any alcoholic beverage, except minimal amounts consumed in connection with a religious ceremony, during the term of a contract of automobile insurance;
- "off-road vehicle" means an off-road vehicle as defined in the Off-Road Vehicles Act, 1983;
- "policy deductible class" means the applicable class of risk exposure selected from among the classes listed in Schedule 5;
- "policy limit class" in relation to a type of coverage means the applicable class or classes of risk exposure selected from among the classes described in Schedule 4;
- "price when new" in relation to a vehicle means the amount paid to the vehicle's dealer or manufacturer by the first purchaser of the vehicle;

"public vehicle" means a vehicle that is used to carry passengers for compensation and includes ambulances and funeral vehicles;

"retail delivery" in relation to the use of commercial vehicles means the delivery of goods sold by retailers to consumers in small quantities or in broken lots or parcels;

"snow vehicle" means a motorized snow vehicle as defined in the Motorized Snow Vehicles Act;

"taxi" means a public vehicle equipped to carry a maximum of six passengers;

"territory class" means the applicable class of risk exposure selected from among the classes listed in Schedule 2;

"trailer" means a trailer as defined in the Highway Traffic Act;

"trailer exposure" in relation to a commercial vehicle means that the commercial vehicle is operated with a trailer attached to it;

"vehicle claims record class" means the applicable class of risk exposure selected from among the classes described in Schedule 13;

"vehicle use rating group" means the applicable class of risk exposure selected from among the classes described in Schedule 12;

"vehicle value rating group" means the applicable class of risk exposure selected from among the classes described in Schedule 6;

"wholesale delivery" in relation to the use of commercial vehicles means the delivery of goods to retail dealers or jobbers for the purpose of retail sale;

"years licensed" in relation to a driver means the number of whole years that the driver has held a licence issued by a governmental authority to operate a motor vehicle.

Types of Contracts and Endorsements

2.-(1) Contracts of automobile insurance that are issued in Standard Policy Form 1 or 2 under the Insurance Act, and the endorsements thereto approved by the Superintendent of

Insurance under subsection 203(1) of the Insurance Act that are set out in subsection (2), are prescribed as the types of contract and types of endorsement to which Part II of the Act applies.

(2) The endorsements referred to in subsection (1) are those written on Standard Endorsement Forms numbered 3, 6a, 6d, 8, 13c, 16, 17, 19, 19a, 20, 22, 22b, 26, 27, 29, 35, 40 and 43r.

(3) Despite subsection (1), Part II of the Act does not apply to any contract of automobile insurance that insures a fleet of commercial vehicles.

(4) In subsection (3), "fleet" means a group of at least five vehicles, each with its own source of power, that are under common ownership or management.

(5) In determining whether a group of vehicles is a fleet, five personal vehicles that would otherwise fall within the group shall be excluded from the group.

Categories of Automobile Insurance

3. The categories of automobile insurance set out in Column 1 of Schedule 1 are prescribed as the categories of automobile insurance for the purposes of the Act.

Classes of Risk Exposure

4. The classes of risk exposure set out in Column 3 of Schedule 1 are prescribed as the classes of risk exposure for

the coverage set out opposite thereto in Column 2 for the category of automobile insurance set out opposite thereto in Column 1.

Principles of Classification

5.-(1) A vehicle that is not a commercial vehicle or a public vehicle shall be assigned to the personal vehicle category of automobile insurance.

(2) A vehicle that is used as a commercial or public vehicle and as a personal vehicle shall be assigned to the category of automobile insurance for which the proportion of the vehicle's use is the greater.

6.-(1) The person who operates a vehicle most frequently shall be designated as the principal driver of the vehicle.

(2) Where more than one person operates a vehicle, a person who is not the principal driver shall be designated as the secondary driver of the vehicle.

(3) Where, in addition to the principal driver, more than one person operates a vehicle, the person with the fewest years licensed shall be designated as the secondary driver of the vehicle.

7. For the purpose of determining the number of years licensed of a driver, the number shall not include any year licensed when the driver would have been ineligible because of the driver's age to obtain a licence in Ontario.

8. A commercial or public vehicle that is operated in Canada and in the United States shall be assigned to a U.S. exposure class of risk exposure under Schedule 1 or 18 where the proportion of the vehicle's use in the United States exceeds the proportion of the vehicle's use in Canada.

9. The radius of travel of a vehicle is the distance travelled by the vehicle from its point of origin to reach the farthest destination to which it is anticipated that the vehicle will travel during the term of a contract of automobile insurance.

10. Where an insured does not know the price when new of a vehicle, the insurer and the insured shall at the time of entering into the contract of automobile insurance agree upon an amount to be used to substitute for the price when new of the vehicle to determine the price when new class of risk exposure, if any.

Personal Vehicles

11. No personal vehicle shall be assigned to the farm use class of risk exposure unless,

- (a) the vehicle is owned by a person who resides on a farm and engages in farming; and
- (b) the vehicle is not used for commuting or a business not related to farming.

12. A personal vehicle shall be assigned to the pleasure use class of risk exposure if it does not fall within any other class of use.

13.-(1) Despite section 6, no person shall be designated as the secondary driver of more than one personal vehicle in a household.

(2) Where, in a household, there are more personal vehicles than there are secondary drivers, the insurer and the insured shall agree at the time of entering into the contract of automobile insurance upon the vehicle to which each secondary driver is assigned for insurance purposes.

Commercial Vehicles

14. A commercial vehicle shall be classified as being operated by identified drivers if,

- (a) it is operated by a maximum of three drivers;
- (b) the principal driver owns the vehicle; and
- (c) the principal driver and the additional drivers are named in the application for the contract of automobile insurance.

Public Vehicles

15. A bus that is used as an interurban bus and used for other purposes shall be assigned to the interurban bus subcategory of automobile insurance.

16.-(1) A taxi shall be classified as an owner-operated taxi if,

- (a) the taxi is operated by its owner or long-term lessee;
- (b) the taxi is operated by a maximum of two additional drivers; and
- (c) the owner or lessee, as the case may be, and the additional drivers are named in the application for the contract of automobile insurance.

(2) In this section, "long-term lessee" means a person who, by an agreement in writing, is the lessee of a taxi for a period of at least one year from the date of the contract of automobile insurance.

APPENDIX XVII

Summary: I.B.C. Ontario Bodily Injury Claims Survey

February 1987

The survey requested individual returns for all claims in excess of \$90,000 and a sampling of claims between \$25,000 and \$90,000 on Ontario bodily injury Claims settled during 1985 and 1986 with accident dates of 1981 to 1983.

These two layers were combined using a 40:60 weight scheme and all percentage costs referred to in the following section will be the weighted figures. The weights are established based on the 1983 Fiscal Policy Year Bodily Injury Size-of-Loss distribution (Ontario Private Passenger - excluding farmers) which shows that claims beyond \$25,000 made up approximately 65% of total Bodily Injury losses (with an approximate 60:40 split for the two layers).

There were in total approximately 1,300 claims returned to the Bureau and 1,144 were accepted after validation.

The survey results can be summarized as follows:

1. Taken together, prejudgment interest and Family Law Act claims constitute 19% of the total claims cost for claims greater than \$25,000.
2. Non-pecuniary losses make up another 29% of the total claims costs for claims beyond \$25,000.
3. Future care and future economic losses (including gross up and fund management) make up a further 21% of total claim costs for claims over \$25,000, and become a progressively significant portion of the larger claims.
4. Because of the design of the claims survey form, it is unclear from the survey if gross up was a significant factor in the claims. It should be noted that claims subjected to gross-up may be ultimately settled by Structured Settlement.
5. Third party legal costs represent another 9% of total claims costs for claims greater than \$25,000.

6. First party legal and investigation costs make up another 7% of the claims beyond \$25,000.

While the results of this survey do not totally explain the escalating bodily injury costs in Ontario (up 90% in the last five years), they do reveal that Family Law Act claims and prejudgment interest have had a significant impact on such costs and that non-pecuniary losses are also a very significant part of total bodily injury costs. In addition, loss costs per vehicle have further been affected by the increasing frequency of bodily injury claims.

FISCAL POLICY YEAR	ONTARIO BI LOSS COST PER VEHICLE
1981	112.20
1982	119.08
1983	142.73
1984	168.78
1985	199.08
1986	213.63

I.B.C. ONTARIO BODILY INJURY CLAIMS SURVEY
1981 - 1983 ACCIDENT YEAR CLAIMS CLOSED IN 1985-1986
PERCENTAGE OF TOTAL LOSS AND LOSS ADJUSTMENT EXPENSE

CATEGORY	CLAIMS \$25,000 TO \$90,000	OVER \$90,000	WEIGHTED AVERAGE
Past Income	16.0	11.9	13.5
Past Medical & Funeral & Other	1.4	1.0	1.2
Future Economic (including Gross up & Fund Management)	5.6	27.1	18.5
Future Care	0.2	4.1	2.5
Prejudgment Interest	13.0	9.0	10.6
TOTAL ECONOMIC	36.2	53.1	46.3
Non-Pecuniary Damages	38.7	22.9	29.3
<u>Family Law Reform Act</u>	5.3	10.5	8.4
Party and Party Costs	10.2	8.1	8.9
<u>Solicitor/Client Investigation</u>	9.6	5.4	7.1
GRAND TOTAL	100.0	100.0	100.0
WEIGHTS FOR AVERAGE	40.0	60.0	100.0

APPENDIX XVIII

1986 LEADERS IN DIRECT
AUTOMOBILE INSURANCE PREMIUMS WRITTEN
-ONTARIO-

<u>RANK</u>	<u>COMPANY</u>	<u>\$ (millions)</u>
1	Co-Operators General	279,167
2	State Farm Group	210,323
3	Royal Insurance Canada	177,976
4	Economical Group	177,192
5	Pilot Insurance	149,816
6	Zurich Insurance	123,992
7	Allstate of Canada	122,171
8	General Accident	119,294
9	Dominion of Canada Gr.	118,183
10	Commercial Union	89,679
11	Safeco Insurance Gr.	85,200
12	Phoenix Continental	73,694
13	Travelers Canada	73,493
14	Wellington Insurance	70,534
15	Guardian of Canada	60,644
16	Wawanesa Mutual	60,330
17	Liberty Mutual Group	59,891
18	Gore Mutual Insurance	51,148
19	Home Insurance	51,018
20	Canadian General Gr.	45,528
21	Simcoe Erie Group	40,079
22	Halifax Insurance	38,442
23	Guarantee of N. America	37,436
24	Scottish & York	35,709
25	Indep. Ins. Mgrs. Group	32,023
26	CIGNA Ins. Co. of Canada	27,246
27	Marxel Insurance	26,837
28	Prudential Assurance	25,907
29	USF & G. Insurance Group	25,754
30	Hartford Group	24,998
31	Transit Insurance	24,277
32	Canadian Surety Ins.	23,585
33	Aetna Cas. Co. of Can.	23,100
34	Laurentian General	22,891
35	Ontario Mutual Assoc.	22,434
36	Advocate General	20,223
37	Constitution Insurance	19,838
38	Prud. of America Gen.	17,803
39	Metropolitan Insurance	17,776
40	CAA Insurance Co. (Ontario)	17,008
41	Anglo-Gibraltar Gr.	16,985
42	Sun Alliance Ins.	16,826
43	PAFCO Financial Holdings	16,628

44	Unifund Assurance	15,074
45	Lloyd's Non-Marine	14,151
46	Employers of Wausau	13,639
47	Eaton Insurance	13,338
48	Lumbermens Mutual Cas.	13,119
49	Federation Ins. Group	13,091
50	Tevco Insurance	13,063
51	Federated Mutual	12,085
52	Abstainers Insurance	10,426

Total of 52 insurance companies with direct written premium volumes greater than \$10 million	2,891,064
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Balance of leading insurers	<u>71,310</u>
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Total of 70 leading insurers	2,962,374*
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Estimated premium volume for the balance of the insurers in Ontario	<u>37,626</u>
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Estimated Grand Total	<u><u>3,000,000</u></u>
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* Source: Canadian Insurance Agent and Broker 1987 Annual Review of Statistics.

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